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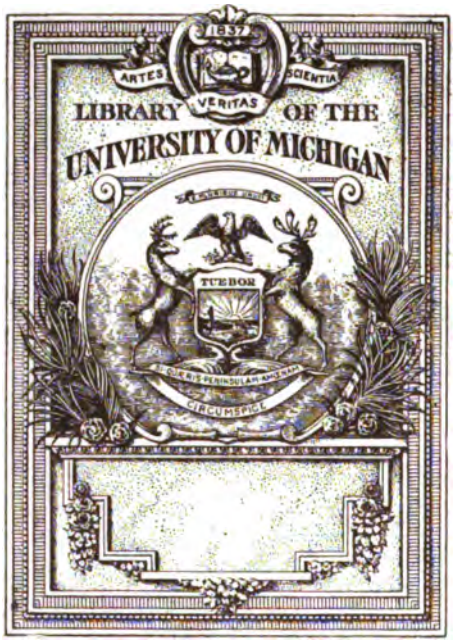
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1913



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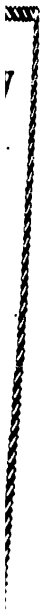
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The American Annual of Photography 1913

VOLUME XXVII

Edited by Percy Y. Howe



NEW YORK
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PREFACE

THE variety of subjects treated of in this, the twenty-seventh volume of the AMERICAN ANNUAL OF PHOTOGRAPHY, demonstrates that photography in all its branches is of ever increasing interest.

The contributed papers cover almost every branch of photographic activity, and the illustrations form a representative collection of the best work of the year.

Many thanks to all who have helped in the making of this book, especially to those whose contributions are omitted through lack of space.

PERCY Y. HOWE.

NEW YORK, November, 1912.

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	31	..	..	..	..	..	..

	S	M	T	W	T	F	S
Sept.	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	..	..	..	..
Oct.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
Nov.	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
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Dec.	..	1	2	3	4	5	6
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1914

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Jan.	..	..	..	..	1	2	3
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	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
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Feb.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	..	..	..	..	..	..	..
Mar.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	..	..	..	..
April	..	..	..	1	2	3	4
	5	6	7	8	9	10	11
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	S	M	T	W	T	F	S
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	..	..	..	..	..	..
June	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	..	..	..	..
July	..	..	..	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	..
Aug.	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
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Sept.	..	..	1	2	3	4	5
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Oct.	..	..	..	..	..	1	2
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Nov.	..	1	2	3	4	5	6
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PORTRAIT. **Ryland W. Phillips.**

The American Annual of Photography · · 1913

SCREENLESS COLOR PHOTOGRAPHY

By MARCUS G. LOVELACE

THE idea of obtaining an image in colors by means of the camera seems to have constantly occurred to the early investigators of the art, but its difficulties were strangely minimized. It was largely the opinion of those who should have known best, that the matter of making a colored image was a detail of the main process that would be worked out a little later.

The basic facts and principles of the art-science were so new, and they had been so absolutely confounded by this new marvel, that for a time incredulity seems to have been a lost art. Many of the early investigators were led astray by the fact that not infrequently the image of the daguerreotype presented itself in colors more or less true to nature. This fact is well attested, and we can but believe that there was a formation of one of the sub-chlorides of silver in the delicate film of the daguerreotype, or that the colors were due to laminae of silver. The former explanation seems the most plausible, at first sight, but in the original daguerreotype chlorides played no part, and the formation of laminae of silver is probably the correct one.

The other early method which possessed the greatest fascination for many of the great pioneers was that of the use of the sub-chlorides of silver—notably the violet. From the days of

Seebeck and Poitvin the devotees of this clue to direct color photography have followed its course, but with little or no direct result. The great point of this method is that it has so far been impossible to render the results permanent. The possibilities are great, and it needs but another Sir John Herschel to tell us of a fixing salt that will hold the colors as they are. The first work along this line was done by Seebeck, who in 1810 noted that some of the chlorides of silver took on the same shade of colors as the light that they were exposed to. The violet rays, however, produced brown, blue and violet; the blue rays produced only blue, and the red rays produced a very fair red. Herschel in 1839 in a paper to the Royal Society described the very beautiful representation of the spectrum that he had obtained by exposing a surface of silver chloride to the action of the sun's rays when dispersed by a prism.

Hunt, Becquerel and Niepce de St. Victor, the distinguished relative of the real discoverer of photography, were all at work at this idea in the course of the next few years, and lastly Poitvin, who had touched so many sides of photography, came nearer to the goal than anyone before him, and whose results represent practically all that has ever been achieved along that line. Sulphuric acid was the fixing agent used by Poitvin, and with fair results. The prints, however, would not stand exposure to strong light for any length of time. His researches, however, have borne no fruit, although the process is more nearly what is meant by color photography than any screen plate can be.

In spite of its apparent simplicity and its satisfactory rendition of color, the Poitvin process, boundless as are its possibilities, up to the present has remained a laboratory experiment. In 1887 Carey Lea became the most interesting figure in the photographic world from his papers on the haloid salts. He conclusively demonstrated that these were capable of taking many colors, through the action of light or even of chemical means. The salts were ranged in the order of bromide, iodide and chloride as regards the variety of shades that were found possible of production.

The red chloride was found to be capable of covering almost the entire of the visible spectrum, as far as the number



THE STATUE. GEORGE S. SEYMOUR.

of shades producible was concerned. This may have been formed in the Poitvin method, although Poitvin distinctly states that the salt formed was the violet sub-chloride. Carey Lea obtained fairly good copies of the spectrum in his experiments, although the green and yellow were rather feeble. This difficulty could be overcome, doubtless, by the use of suitable screens to restrain the balance of the visible spectrum, allowing the yellow and green rays sufficient time to act with equal intensity with the subdued rays. Lea tells us that under different colored glasses he obtained fair representations of the colors of the intervening screen. The fact of his using glasses speaks for itself. Those of us who in younger days have used the shilling ruby lamp, with a piece of deep ruby glass, can remember the amount of actinic light a "deep ruby" will pass if it is not spectroscopically right for the purpose.

Under the action of white light these chlorides all darkened, but on the addition of a small amount of lead or zinc chloride this was obviated and the paper would bleach in white light. The presence of a small quantity of sodium salicylate in the coating of the paper was found to increase the speed very much and greatly reduced the time of printing. This method of color prints has always seemed to the writer to be greatly neglected for the three color process, and it seems a great pity that none of our modern research men have taken this matter under their consideration.

The process itself is simple. Paper is coated with emulsion of silver nitrate alone, without any bromides or iodides being added. After being dried the paper is immersed in cuprous chloride, dissolved in water. Sub-chloride of silver is formed which is capable of taking almost any color of the rainbow, according to the shade of light that it is exposed to, and requiring but a more suitable method of fixing to make it a most simple and satisfactory process. The experiments of Poitvin and Carey Lea may be found in any photographic dictionary worth the name, and are easily repeated.

The Lippmann process referred to is the invention of Prof. Gabriel Lippmann in 1891, and depends on the phenomena of interference of light waves for its success. Reflection on themselves of the waves of light falling on the plate produce laminae of silver in the film that produce color in the same



SWEET MEMORIES.

Copyright, 1911, by Knaffl & Bro.

way that a piece of pearl does, or the prismatic colors in a soap bubble.

The plates themselves are rather peculiar, but can be made with sufficient perfection at home to enable curious ones to test the process. The following formula by Mr. Senior will be found very satisfactory:

No. 1

Gelatine (Nelson's No. 1)	75 grains
Potassium bromide	32 grains
Water	8 ozs.

No. 2

Gelatine	75 grains
Silver nitrate	45 grains
Water	8 ozs.

The gelatine should be swelled in each case and then dissolved in water raised to about 80° Fahr. When all is in solution add No. 2 to No. 1 slowly and proceed to coat plates at once, as the grain becomes coarse if the emulsion is allowed to stand, and will fail of its purpose. Just before coating add the following solution to render the emulsion orthochromatic, the following quantity being added to each 3½ ounces of emulsion:

50 minims.....1:500 solution cyanine in alcohol
33 minims.....1:500 solution erythrosine in alcohol
170 minims..saturated solution glycin red in alcohol

The emulsion should then be filtered through fine silk or muslin and coated on the plates, which should be cooled immediately on ice. When set they should be washed for about one-half hour and dried. These plates may be obtained commercially of Richard Jahr, of Dresden, who also supplies all the apparatus for the process. The speed of the plates may be increased somewhat by flowing them before exposure with an alcoholic solution of aceto-nitrate of silver, or by the addition of a small amount of silver eoside to the emulsion, about 3 grains to each 3½ ounces of emulsion being about right.

A little sodium sulphite added to the emulsion will enable one to heat the emulsion to 102° Fahr. with corresponding increase in speed and with little injury to the grain. The exposure must be made through the glass, with the plate



ROVER. *Copyright, 1904, D. J. Bordeaux.*

backed with mercury. Slides are made for this purpose, but it is possible to improvise a slide that will be quite sufficient for experimental work. The mercury must be C.P. and the film of the plate should be in the plane of the ground glass. The plate holder thus is really a trough in which the plate forms the front surface and which is filled with mercury. The quantity of mercury back of the film need not be very great, a couple of millimeters being sufficient. The mercury must be poured

into the back or plate holder, as you like to call it, as rapidly as possible, or there is a possibility of markings.

Exposures are largely a matter of cut and try, as home-made emulsions vary so much, and the manufactured plates themselves being so very variable in this respect. Four or five minutes at F/8 with the emulsion given would be somewhere near correct. Development should be short as a general thing with a weak developer, as, if the plate is too dense, the colors are either dull or not apparent at all. Fixing should be of short duration, as it is possible to fix the most of the image right out of the plate if overdone.

After washing, bleach in mercuric chloride with a little bromide added and then blacken in sodium sulphite. A little underexposure with subsequent intensification frequently gives better results than straight development. On drying, the colors are apparent when the plate is viewed at the proper angle. That is the fault of the whole process. There is no satisfactory way of projecting them on the screen, and neither can one make prints from them with any of the colored paper processes.

The results, however, are very beautiful as a general thing. The colors are produced in the film by the interference of the waves of light. The ray passing through the film rebounds from the mercury and forms laminae of silver in the film at the points of reinforcement between the direct and the reflected rays.

Rothé, of Paris, has succeeded in obtaining results equal to the generally accepted process by simply placing the plate in the dark slide without mercury, the reflection in this case being doubtless due to the air surface in contact with the plate. It has also been suggested that celluloid or collodion films might be silvered and then pressed into optical contact with the film, and with equally good results.

Senior, of London, has measured these laminae of silver and found them to be separate films of silver with distinct separating spaces. The plates must be viewed at a certain angle, which must be established by trial, when all the colors of the original become apparent. The Lippmann plates are very true to nature, and, as a matter of fact, are more nearly a perfect reproduction than any of the other processes. They



THE YOUNG READER. J. C. STRAUSS.

are the only plate which has ever been satisfactorily adapted to the photography of the spectrum, and for a very simple reason. The Lippmann plate uses the pure spectral colors and allows them to work without let or hindrance on the sensitive salts.

The other color processes all reduce the spectrum to mixtures of three colors, and until the three filters of the screen plates are the three spectral colors that are needed they will not be available for spectrophotography. Dr. Duncan, of the University of Wisconsin, showed us last winter some autochrome plates of spectra and polarisation phenomena. The spectra were all reduced to the three well-known colors of the autochrome plate, cutting off abruptly at the ends of the color. The Lippmann plate does, however, give splendid representations of the spectrum and with remarkable fidelity.

Prints in colors are what we are all looking for, and while the Uto paper gives us very good results there seems to be something that is wanting; possibly the Poitvin process will be brought to the point of commercial availability and give us better prints than we get on Uto paper.

It is possible that some of the readers of the ANNUAL may care to try to make a bleach-out paper similar to Uto, although not the same thing. Coat good paper with the following emulsion: Soft gelatine, 90 grains; water, 2 1/10 ounces. Soak gelatine until swelled and then gently heat until dissolved, adding 60 minims of a 2/10 per cent solution of methylene blue, 25 minims of alcoholic solution of auramine of the same strength and 30 minims of ½ per cent solution of erythrosine. Filter and coat on glass or paper. Before using, the film must be exposed to the action of hydrogen peroxide for a short time.

About 10 minutes under a colored transparency will be sufficient printing in good light, the print afterward being soaked in water. The results are generally very satisfactory. A piece of 5/100 celluloid between the paper and the transparency will kill the grain and serve to protect the transparency.

The above is a modification of the Neuhauss-Sczepanik process and will be found to be very satisfactory in a modest sort of way, although the colors are not as good as those of

Uto paper. The direct process in colors is not yet, in the humble opinion of the writer, although the plates and papers that are on the market give us some very beautiful results. It is hoped that possibly this little note on the direct color processes may awaken interest in the mind of some lucky one who may find the desired means of making pictures as we see them and of giving us good prints on paper as well as on glass, and giving us lantern slides in colors that will not need an arc light to get fair illumination on the screen.

Just think of the possibility of making colored enlargements. But enough; the subject is too fascinating. Ours is a great art, and an unappreciated one. The first steps are too easy—too productive of the man who goes around with a 5 x 7 on his shoulder and a caller-out by his side, and the chap who runs a post-card gallery and produces horrible things at ten minutes' notice with a Cooper-Hewitt light. We are not well enough organized. We need more clubs with good reading rooms, stocked with a *good* library of works on the subject and its kindred ones, chemistry and art.

Most of us are far too ignorant of the chemical side of our work. Many of the worst blunders of the old-timer, as well as the beginner, can be traced to this fact. I met a man not long ago who substituted sodium carbonate for sodium sulphite in his fixing bath because he was short of sulphite and seemed to think any sodium salt would do.

We should be proud of our art. It has given the world the illustrated magazine if nothing else. It has copied the masterpieces of the old world in their actual colors. It has placed within the reach of the masses a multitude of pictures and scenes of immense value from a cultural standpoint; in fact, John Richard Green, the famous historian-clergyman-philanthropist, used to say that he regarded the six-penny photograph as doing more to keep up the family spirit in the homes of the poor, in the inevitable separation that comes to the great army of "have-nots" so much sooner than to the "haves."

We should be proud of our great brother photographers—those who have done so much for the art with the handicap of the incompetent within the ranks and the soi-disant "art" critic without, the type who imagines a year's residence in Europe and ability to make a poor sketch is sufficient ground

on which to sneer at photography as an art. Let us be kind to the amateur; we all began that way, and the time is still within the memory of man when the best of us—Norrie, Duhrkoop, Stieglitz and the rest—didn't know a speed shutter from spherical aberration. If it were not for the amateurs the stock houses would soon be under water, and many of the men who have a sign out and are doing professional work could learn much from some of the enthusiastic amateurs around them.



FIDO. THEO. ANDERSON.



THE COTTAGE IN THE WOOD. FRANK E. HUSON.

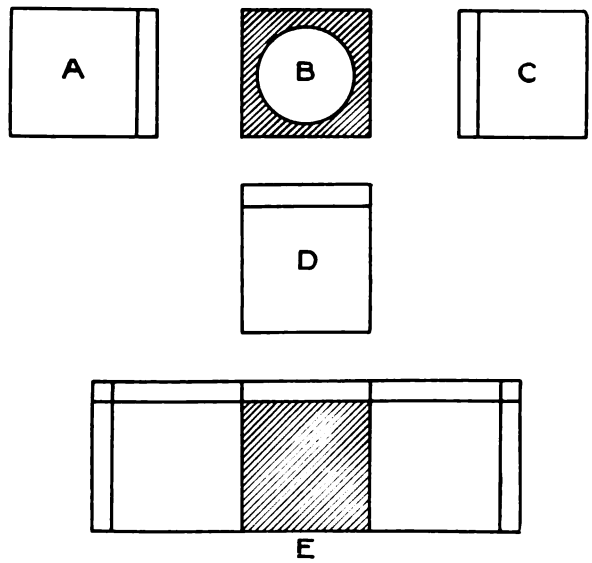


Figure 1.
Illustrating "An Efficient Folding Lens Hood." FRANK E. HUSON.

AN EFFICIENT FOLDING LENS HOOD

By FRANK E. HUSON

THE advantages of a fairly long hood in the form of a tube to push on the lens are too generally known to need further recommendation. Stiff tubes, whilst efficient, are rather a nuisance to carry about, will not pack easily, and very liable to get crushed.

Experimenting a few days ago I found that a hood which will extend to about three inches or longer if desired, and be, when open, if anything, firmer than a light tube, can be made in a short time. It will fold to about one-quarter inch thick, traveling quite comfortably in the waistcoat pocket. It further has the advantage of allowing the use of light filters upon the lens mount, and in the case of my own quarter-plate outfit, a Goerz Anschutz, the hood may be folded and rarely removed from the lens.

Briefly, the hood is very much on the lines of a focusing hood with stiff sides to hold it out firmly when in use.

A piece of thin wood is made square (the size governing the extension of the hood when open), a circular hole being cut just a little larger than will fit the lens as B, Figure 1, a piece of velvet being fastened round the edge a little wider each side than the wood is thick. When dry the edges may be glued down to the faces of the wood. Four pieces of cardboard are now cut a little smaller than the panel, three of which are shown in A C D.

All four are covered upon the inside with velvet (to stop reflections as much as possible), A and C being covered upon the outside with black lining having a little tag also fitted for ease in opening, a piece of leather being provided for D, but

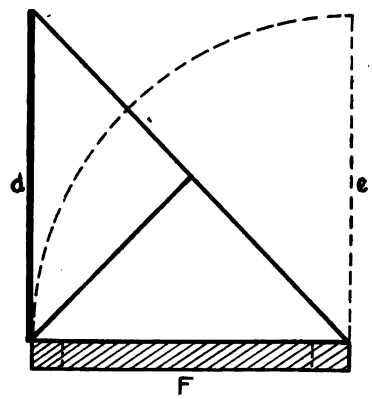


Figure 2.

not fixed for the time being, all being sufficiently long to form enough for a hinge on one side, as shown. E is a piece of lining sufficient to go three parts round the panel and enough for joining with one piece of card glued as shown shaded.

After fastening the overlapping ends of E to the top edges of D, and gluing the leather over the top of all, the two flaps A and C may be glued to opposite edges of B. When all is dry E and D together may be slipped over B (with the flaps folded over the front), being joined with glue and pins along the edge. The hood is now complete except for folding, and

this can readily be understood upon reference to F, Figure 2, which is intended to represent the complete hood viewed from the side, e and d referring to the same parts as E and D.

Upon pushing in e (with the two inside flaps previously folded down not shown in F) we get a triangular piece of lining left, which is creased over in the center to bring down d over all to finally close. It should be evident that the two flaps A and C, being pulled out last by their little tags, they support the whole as a rigid box.

The photograph, Figure 3, shows the hood fitting to my folding camera with a Busch "Glaukar" Anastigmat F/3.1, which I find invaluable for high-speed work and night photography.

Note the metal framing at the back of the hood showing the maximum size of same when folded.

I am afraid the details of such a very simple contrivance are somewhat lengthy in explanation, but my readers will no doubt realize, especially when working against the light, that the expenditure of a little time upon the making of such an article will be time well spent.



Figure 3.
Illustrating "An Efficient Folding Lens Hood." FRANK E. HUSON.



PAYSAGE LAUDAIS, CHARLEON. A. Gomez Gimeno.



PINHOLE ENLARGING

By A. E. SWOYER

PHOTOGRAPHY, in common with all other arts, moves in a cycle. We have passed through the stage of microscopic definition, and bald-headed skies, and the modern pictorialist endeavors to portray nature as it is actually seen by the eye. Sometimes, unfortunately, the extremist apparently utilizes his imagination to a greater degree than he does his eyesight. However that may be, the changing requirements of the photographer have produced a radical alteration in his equipment. The old reliable "eight by ten" has given place to the vest-pocket camera, with speed shutter and anastigmat lens, used in conjunction with the enlarging lantern.

The very perfection of the anastigmat, however, militates against pictorial expression. It is designed to portray the finest of detail, and when this is suppressed by throwing the lens slightly out of focus it is not only producing an abortion of the purpose of the lens, but it tends to produce falsified results. Leaving the new pictorial lenses out of the question, it is then necessary to secure any desired changes through the medium of the enlarging lantern, and it is along this line that the writer has experimented with the pinhole.

Used for enlarging, the pinhole has three advantages: it will produce an enlargement in which the original microscopic definition of the negative is pleasingly diffused; it permits this diffusion to be controlled within wide limits; having no fixed focal length, it may be mounted in a movable partition in a box similar to the fixed-focus daylight enlargers, which, by simply changing the relative distances between pinhole, negative and paper, will produce any desired degree of enlargement with the certainty of being in focus.

Against these items we must offset the increased exposure which is necessary, and which makes it impractical to utilize artificial light in connection with the pinhole for enlarging pur-

poses. Also, the very softness and quality of a pinhole enlargement (Figures 1 and 2), which makes it so suitable for certain classes of work, unfit it for work where a critical definition is essential. True, sharpness may be obtained by abnormally increasing the distance between aperture and negative, but it is not the sharpness possible to obtain with a high-class lens.

The writer uses for this class of enlarging a special box with a negative holder at one end and a bromide-paper support at the other; between is a movable partition carrying the pinhole and having a protruding handle which moves in a slot



Figure 1.

provided with a light-trap of black velvet. Since focal length does not enter into the calculation of ratio of enlargement, the latter being governed entirely by the relative distance between paper and pinhole and between pinhole and negative, it is obvious that the position for the sliding partition for each degree of enlargement may be marked upon the outside of the box and focusing obviated thereby.

A ground glass for determining the exact degree of diffusion is essential, however, as it is the ability to vary this which offers the greatest advantage of the method. We have said that the ratio of enlargement depends upon the relation between certain distances. We may add that the degree of



Figure 2.
Illustrating Article "Pinhole Enlarging," by A. E. Swoyer.

diffusion depends upon the distances themselves. Thus we may suppose that the negative is six inches from the aperture, and that the sensitive paper is twelve inches from the latter; obviously a two times enlargement will result. But if the first distance is increased to twelve inches and the other factor doubled in proportion, it is obvious that there is no change in the degree of enlargement; this is true for an infinite number of pairs of distances. There will, however, be a constantly increasing sharpness as the distance between negative and pinhole is increased, coupled with an increased exposure, both of these elements varying in a more or less constant degree with this distance.

In practice it pays to determine the exposure necessary with an average negative, say six inches from the pinhole; for a two times enlargement on Eastman Standard bromide, using a No. 8 needle hole, this will be about four minutes. From this, figuring that the intensity of light varies as the square of the distance, it is easy to determine the exposure under other conditions within a reasonable degree. The writer has also found that enlargements made in this manner on a rough bromide paper have a quality which is all their own.



HOAR FROST ON PLANT. WILSON A. BENTLEY.



CHARLOTTE. JANE REECE.

CIVIC EXPLOITATION BY PHOTOGRAPHIC SOCIETIES

By ROBERT E. M. BAIN

ALTHOUGH it has not as yet been tried, there is no question but that the various camera clubs or societies in the various American cities can be of great advantage in exploiting the civic beauties of our cities. In addition, they can promote further improvement by calling attention pictorially to the necessity for tearing down unsightly billboards, tenements and sheds where the removal will serve to beautify the locality.

In all, or nearly all, of the larger American cities there are clubs for offering suggestions to the "city fathers" and others tending towards the improvement of property in general and the increase in the population by making more attractive to visitors the parks, boulevards and drives. The good these clubs do may be increased through intelligent assistance of amateur photographers and their cameras. Reports submitted to the City Council and Aldermanic Boards are usually accompanied by one or two illustrations showing the need, pictorially, for such improvement as is recommended. This is such a short step compared with the flood of pictures which an enthusiastic camera society would produce, that the present idea needs only to be suggested to be made a fact. Let the societies bring this plan to the attention of the clubs of business men and others who are engaged in exploitation, and they will at once fall in with the scheme and will, no doubt, be pleased to supply the material if the society will do the work.

There are a great many festering spots in all large cities where improvements are tabooed, due to the parsimony and want of civic pride on the part of the land owner. So long as his meanness is not put before the public the condition will prevail and the city and adjoining property suffer, but once let in the light and public opinion will bring about a

change, to the advantage of the community—even the mean owner. Many persons stand in their own light, through perverted ideas of economy, in the matter of house and street improvements, and so long as they do not feel the sting of public disapproval their view remains unchanged. Show such conditions up in public print. Things look quite differently in cold black type. Let the various photographic bodies appoint a committee to confer with the civic societies of their cities and then see the proprietors of the public journals. The camera owner will, of course, expect to receive credit for his work, and he is bound to feel a pride that his work has been the means of benefiting the community in which he lives. He will also receive the thanks of his fellow citizens for his help in promoting their welfare and increasing the interest and beauty of the commonwealth.

If the suggestion meets with the welcome it deserves, the camera club can appoint members to "do" certain parts of the city and report at the next meeting with prints, and these can be selected and put under cover for presentation to the civic club at their next assembly. Each member will have his name and address on his prints for reference. At the close of the year all of the pictures submitted or selected can be made up into a general pictorial report for the public eye and report be made in writing, showing the effect or improvement which has been created by this work.



BOULDER BRIDGE, BRONX PARK. JOSEPH LAURIER.



A FIRELIGHT STUDY.

Illustrating Article "Firelight Studies," by Harry S. Hood.

FIRELIGHT STUDIES

By HARRY S. HOOD

AMONG the many interesting and fascinating sides of photography there is none that eclipses the making of pictures with special lighting effects, such as firelight and moonlight studies. Very few amateurs attempt this sort of thing, and they miss one of photography's richest experiences. There is practically no limit to the number of pleasing effects that are possible with this subject, especially when printed in carbon or gum. Many stormy winter evenings may be happily spent at the home fireside, making pictures which will be never-ending sources of pleasure both to the maker and the beholder.

The best plate to use is a double-coated orthochromatic plate. The best developer is the following:

Water	15 ozs.
Metol or Rhodol	24 grs.
Hydrochinone	24 grs.
Eikonogen	24 grs.
Sodium sulphite, dry	½ oz.
Sodium carbonate	320 grs.
Potassium bromide, 10% sol	4 drops

When the model has been posed to the satisfaction of the operator, and the camera is in the proper position with the slide drawn and everything in readiness, the lens should be stopped down to about F/11. Enough Victor flash powder or its equivalent to cover a nickel should then be wrapped in one thickness of tissue paper. All that now remains is to remove the cap from the lens and at the proper moment throw the ball of flash powder into the fire. If the subject has been artistically posed the result will be not only a good photograph, but a good picture. The two illustrations were both made in this manner.

By far the best results are possible if the negative is printed

on either gum or carbon, as orange or red paper stock may be used, giving a very attractive result. A print made on red paper, well sized, using brown carbon tissue, will make a very striking combination. If the gum bichromate process is used red paper with burnt umber pigment will give a charming print.

Most amateurs will probably prefer to make their first few prints on developing paper. A rather pleasing way of finishing them up is to tone the print red. Immerse the well-fixed and washed print in the following:

A

Water 5 drams
Copper sulphate, 10% sol..... 15 minims
Ammonia carbonate, 10% solution. Add till the precipitate first formed is redissolved.

B

Water 4½ ozs.
Potassium ferricyanide 6/10 dram

Mix separately and add B to A. The print will turn bright red. The print should then be well washed.

For moonlight effects the following toning solution gives most excellent results. Immerse the well-fixed and washed print in the following:

Water 5 ozs.
Ferric ammonium citrate..... 12 grs.
Potassium ferricyanide 12 grs.
Nitric acid 2/5 dram

The print will assume a deep blue color. Remove from the toning solution and wash till the whites become clear. Matte or rough-surface papers give the best results with this bath. If a rather dark print is used the finished result can hardly be told from a carbon print.

Work of this nature can be done when the weather makes it impossible to venture out of doors, and it will be found that it is an ideal way to spend a cold, stormy winter evening, when time is apt to hang heavily on one's hands.



THE STOKER.

Illustrating Article "Firelight Studies," by Harry S. Hood.

HOME PORTRAITURE FROM THE STATIONARY PROFESSIONAL'S VIEWPOINT

By F. MORRIS STEADMAN

IN one of the photo magazines of the year I read an opinion from some located brother to the effect that home photography was a fad, and would in all probability die out in a couple of years. In my opinion it is not safe for the man who has all his eggs in the Studio basket to take this point of view. Better dispose of the eggs while they are fresh, or be quite sure of your cold storage facilities.

The pet phrase, "I would as leave visit the dentist as the photographer," is of course, often sprung for the sake of sociability, but back of this you must know that the great majority of men and women consider a trip to the studio a bore. Not necessarily that they are bored at the studio but that the fact of having to get ready and go there is distasteful to them.

In every community we can calculate that there is about a certain amount of work really desired by the different families in the normal run of events, and it is certain that through procrastination less than half of it ever gets to any studio.

Now it cannot be denied that the most of the interests of life centre about the home. Especially those familiar scenes of love, work and play, which fill the days and which pass into the holy of holies of the memory when the child is grown. Perhaps you have gone after art so hard that you can only see beauty in one of these tree backgrounds of the old masters. Your this year's pictures may be on that line.

Speaking of fads, these styles that come and go are fads pure and simple. And you cannot for a moment think that you are doing any permanent service to yourself, or to the cause of art, in "working in" such grounds in your portraits.



A HOME PORTRAIT. F. MORRIS STEADMAN.

But I am digressing. What I wished to say is that perhaps on account of the studio routine of your work, you have forgotten what subjects for real pictures there are in and about the home. Name over to yourself a few of the things which linger in your memory of home. I shall not begin them, for the list is too long.

A generation of training in the thought that a trip to the "Gallery" is necessary in order to have photographs made is the thing that holds the people to it. It is a live illustration of how a bad habit will stick. The photographer who is natural, and not entirely in a rut, I am sure would much rather photograph people in their homes than in a studio. It would be a fine thing either for the under-worked, or the over-worked studio man, to make the experiment of some sittings in the homes.

One thing you may learn quickly, and that is that it requires more knowledge to get the light correctly distributed over a face or figure in a grove or garden, or in an ordinary room, than it does under the "sky-light." Out of doors it is usually a matter of selection, or analysis, and in a room of correct manipulation. If you realize that you are not able to do it can't you feel also a sort of desire to learn to do it?

Are not you tempted to trade the walls of your studio for forest trees, or vines in the garden, and your corrugated glass for just ordinary blue sky? I know it leaks like fury—but only when it rains. When you are learning how to get good lightings out in nature, and in a home window, you are learning natural laws, and not the final manipulation of curtains that are made three quarters right at the start.

I have had nearly twenty years' solid experience in home portraiture, and from the mental attitude of my patrons toward the idea, I know that it is not a fad, but that in a generation or two it will be practically the only way photography will be done, with possibly a very few notable exceptions. I am always tempted to think that such men as our best professionals can always bring people to them and retain their studios. But why should this be so when we consider that the real inspiring things, the things that belong to life, and are of interest to "take," are in the homes?

I would rather think, for example, of a man like Core being

called to California to do work, as a sign of his superiority, than to think of him wishing to stay away from the homes. It seems to me that in the long run the man who will refuse to go to the homes with his ability will be, in a way, confessing to a lack of appreciation of the truth and interest of life, and that there will enter into his soul the germs of deterioration.

But in days to come, when our best men do home portraits, the purse will have to open well in recompense. This is because in all lines of work which require taste and humanity the supply of workmen is under the demand for them.

But this concerns personal excellence. Another problem is the one of simple and average good taste, and the worker who can employ the same in home work. The thing which hinders the extension of professional home portraiture to a great extent is the lack of knowledge of the fundamental laws by which nature makes its effects of light, and shade, and actinic gradation, which are necessary to secure good relief and modeling in photographs. Some of the high priced home work of the present day is extremely shoppy in appearance, as backgrounds are used which do away altogether with the home effect. These are not the coming home photography, and this kind may be called a fad.

But, in the end, professional home portraiture is just as truly doomed to annihilation as is the studio.

Most businesses are constantly going through phases or changes owing to the development of new inventions. and the application of new ideas in method. Photography is a very lively example of this truth.

The final stage in the development of photography is not the professional home portraitist but "home pictures by home people." This is inevitable, simply because it is the natural result of progress in learning to use a Kodak or other camera. Only yesterday a clerk in a Kodak store told me that fully half of all the exposures brought in for development were total failures. The average I once found in a finishing record about eight years ago was 79 per cent. It seems there is some improvement, but perhaps it is only that they are sticking closer to "snap shots."

The amateur is to-day being educated downwards. The popular advertising phrase "Photography without the bother"

should really be read "Photography without the pictures." These conditions are what make the professional laugh at any warning as to the encroachment of amateur pictures on his business, but these conditions will not always prevail. It is a frail thing indeed that hangs over the head of the profession. It is just a little ignorance concerning the matter of light and shade and values.

The factories are to-day working over-time building, in the main, the cheapest grades of cameras, the grades that the novice buys and goes on a film consuming spree with. Advertising to-day is addressed to this class of buyers. This is good business, but the field will be covered some day except for the growing children.

On the other side of the problem is the absolute neglect of the actinic property of light as a study in the schools. This study of light belongs to physics as truly as the noun belongs to the study of language. In other words—what is needed to know to banish this cloud which gives its protecting shade to the profession is not vague and evasive. It is not something intangible which a man must develop in his own consciousness by years of experience. It is, on the contrary a very simple set of definable truths, teachable and supremely interesting to learn.

It would be a lot more interesting to Mary Jones to learn the truths of light so as to be able to make correct exposures with her Kodak, than to learn how many cubic feet of dirt would come out of a cellar of given dimensions. She should learn both, of course, but the one she would be interested to use while many of the other things learned at school would be forgotten.

I firmly believe that photography, or the study of actinic light, will come "into its own" some day, and when that day does come it is easy to guess where the Profession will be.



OUTDOOR PORTRAIT.

F. MORRIS STEADMAN.



SLUMBER SWEET. C. F. CLARKE.

INTENSIFIERS, ANCIENT AND MODERN; WITH SOME APPLICATIONS

By G. T. HARRIS, F. R. P. S.

IT is a safe assertion to make that even in these days of exposure meters and clocks for developing, the plate that leaves the fixing bath so perfect as to require no subsequent treatment is of less frequent occurrence than is generally admitted. Oftener than not considerable improvement may be effected, either generally or locally, by a judicious application of either reducer or intensifier.

The practical photographer requires a print of a certain standard of quality from his negatives, and it is rarely, indeed,



A BABY BOY. EDITH L. WILLIS.

that a negative printed from in the condition in which it left the fixing bath is capable of giving a print of the finest quality. The tyro in photography develops his plate and accepts the result; the professional photographer has a standard of quality to which he must bring all his negatives. I am prepared to hear that "tinkering" with the negative interferes with the original scale of gradation, etc. This may be, but it is well known to every practical photographer that the public judge by the general appearance of the print, not by nice distinctions of gradation. To this end then, *i. e.*, the production of a print of the highest technical quality, the

professional photographer must avail himself of every contributing agent.

In my own business of view-publishing I find that I am constantly employing both intensifiers and reducers to readjust errors of exposure and development. And, more than this, I find that a particular result is more readily obtained by using a certain formula; as, for instance, when it is desirable to give a steep gradation to a negative in order to increase contrast. The photographer who is working day after day, for months at a stretch, in producing negatives, knows to a nicety, and instantly, just how a negative will print and wherein it falls short of the standard requisite to give the desired quality. Let me anticipate criticism by saying that it is absolutely no sign of slovenly workmanship to require the adventitious aids of intensifying and reducing formulæ. The fault must be found with those who accept their negatives as they find them, and make the best, or the worst, of the prints obtained from them.

Negatives for intensification may be grouped for convenience under three heads: 1. Those requiring the original image merely strengthened. 2. Those having too extended a scale of gradation, and 3. Under-exposed negatives. Or, put in other words, correctly exposed but under-developed negatives, over-exposed negatives and under-exposed negatives. Fortunately, so many excellent formulæ for intensifiers exist that it is not difficult to suit each group with an intensifier giving the desired result.

Dealing first with class 1, negatives in which the original image merely requires strengthening. The negatives typical of this class are largely those held in view by the designers of intensifying formulæ; hence a considerable wealth of intensifiers is open to the worker. Usually the amount of additional opacity required by negatives of this class is not great; often merely a minute's application will suffice to give just the requisite "sparkle" to the print from it. Under such conditions the mercuric iodide intensifier originated by B. J. Edwards, and subsequently modified by Lumière, is most attractive. The negative may be taken from the fixing bath, merely rinsed, and the intensifier applied, when the exact amount given can be seen. Unfortunately, the results are



PORTRAIT. O. C. Conkling.



not permanent, though for negatives not wanted for indefinite periods the length of life is satisfactory. When using this intensifier I always estimate the lasting power of the negative at four years, but when it has faded to the yellow iodide stage it may be resuscitated by removing the varnish and applying a weak solution of sodium sulphide. Lumière's formula has practically superseded the earlier one of B. J. Edwards, though in actual practice there is little to choose between them. Both are given here:

EDWARDS'

Saturated solution bichloride of mercury	10 ounces
Iodide of potassium	10 drachms

Dissolve the iodide in 10 ounces of water and pour gradually into the mercurial solution until the precipitate thrown down is *nearly* redissolved. Add 1 ounce of hyposulphite of soda in crystals.

LUMIÈRE'S

Water	20 ounces
Sodium sulphite	4 ounces
Mercuric iodide	90 grains

The sulphite must be dissolved first. When intensified wash for a short time and redevelop by some such developer as amidol. The application of a developer may, of course, be made to a plate intensified by Edwards' formula, though it was never proposed by the originator. It has been said that Lumière's formula may be relied upon for permanence. I can only warn anyone against too readily accepting this statement. I have used it continuously ever since its original publication for negatives of temporary value, and, however carefully treated, have invariably found them yellow after about four years.

For many years, and even now occasionally, I used silver intensification, and though it will never be a workroom formula it is, from my point of view, the very finest intensifier for the class of negatives under consideration. I have never lost a negative when using it, nor afterward by fading, and I have some by me done twenty years ago. The quality obtained when using it is beyond criticism. Originally the silver

intensifier as used for gelatine negatives was based on the formula used for wet plates. This generally became thick and turbid in use before sufficient intensification had been obtained, and staining the film was often the result. To obviate this I worked out a formula with hydrokinone, which met with considerable popularity, as it was very clean in its working:

SILVER INTENSIFIER

A

Hydrokinone	200 grains
Citric acid	200 grains
Distilled water	20 ounces

B

Silver nitrate	200 grains
Nitric acid	50 mins.
Distilled water	200 ounces

Equal parts are taken of the above and applied to the thoroughly washed negative. If the negative is of moderate size the solution is best applied from a graduate by flowing on and off, after the manner used in developing collodion negatives. I strongly recommend that the operation be conducted either by artificial light or by daylight of low intensity. When sufficient density has been obtained the plate is well rinsed and placed for a few minutes in a clean acid fixing bath of about half the normal strength. As I have said, I do not think this form of intensifier will ever be popular, but my readers may take it as a plain statement that when carefully used it is one of the finest methods of intensifying a gelatine negative.

A silver intensifier was proposed some years ago by Mr. J. B. B. Wellington which I used at the time, and still have the negatives intensified by it, showing no sign whatever of deterioration. It is a very fine intensifier and possesses the advantage of allowing the amount of intensification to be seen as the application is continued, so that just the right amount may be given. Furthermore, a plate may be taken straight from the hypo bath, rinsed and intensified. Mr. Wellington's original formula was: Nitrate of silver, 100 grains, to 2 ounces of water. Half an ounce of sulpho-cyanide of



HUGH DOBBINS. L. A. DOZER.

ammonium is added, which at first produces a precipitate which is afterward redissolved. Make up the solution to 10 ounces of water. This again causes a precipitate, which must be dissolved by adding a sufficient quantity of hyposulphite of soda. To intensify a negative an equal quantity of the sulpho-cyanide of silver solution and of a 3-grain pyro and soda developer are taken and poured over the plate, when intensification rapidly proceeds. At the photographic convention of 1911 Mr. Wellington read a paper detailing a modified form of this intensifier, which consists principally in using a weak bleaching agent for a short time previous to intensification, thus:

Potassium ferricyanide	20 grains
Potassium bromide	20 grains
Water	20 ounces

is applied for exactly one minute and the plate afterward washed for several minutes.

Coming now to substitution processes that may be used for correctly exposed but under-developed negatives, the two most important are those depending upon the use of chromium and mercury. Mr. Chapman Jones, the great champion of mercury intensification, speaks in no uncertain terms of its permanence and excellence. My own use of it has been limited, but I have certainly had fine results by its aid. As a workroom intensifier, however, I think it cannot compare with the now popular chromium intensifier. My own preference when using mercurial intensification is to redevelop the bleached image with a hydrokinone developer; this, I believe, from a laboratory point of view, is wrong, but for many years I used this very extensively and had no fault whatever to find with it, either on the score of quality or permanence. Mercury, followed by a plain solution of ammonia or of sulphite, is of very doubtful permanence and not to be recommended.

The recently rediscovered chromium intensifier is, perhaps, the nearest to being an ideal workroom intensifier that we possess at present. Mr. E. J. Wall pointed out its excellencies many years ago, but without exciting much interest in it. The only drawback that can be urged against it is the length



SNOWY DAY ON BROADWAY. JOHN E. BOULTENHOUSE.

of time taken to eliminate the bichromate stain, and this may be greatly obviated by placing the bleached plate in a solution of alum. The degree of intensification seems to be dependent on the amount of hydrogen chloride present in the formula, the greater the amount the less being the intensification. C. Welborne Piper has defined rather rigid formulæ for its use in order to secure progressive amounts of intensification, in which he is supported by Mr. G. E. Brown, editor of the *British Journal of Photography*. With all deference to these two photo-physicists I am of the opinion that for every-day use an average strength meets all requirements. My own formula is:

Potassium bichromate	50 grains
Hydrochloric acid	20 minims
Water	10 ounces

After bleaching and thorough elimination of the bichromate stain the plate is redeveloped with a non-staining developer such as amidol. It is necessary that the plate be exposed to daylight before or during redevelopment. The acidified bichromate solution is said not to keep in solution, but I have never found any deterioration when kept for a reasonable time. If bleaching becomes unduly slow it is a sign that more hydrochloric acid is required to compensate for the loss by use.

Class 2, negatives having too extended a scale of gradation, require treating with an intensifier that acts more especially on the denser deposits in order to increase the contrast. Monckhoven's well-known cyanide of silver intensifier is *par excellence* the intensifier most useful for this class of negative, though mercury, followed by blackening with ammonia, is also very suitable. If negatives are flat from over-exposure simply intensifying them does not much mend matters. The best cure is to alternately reduce and intensify until some measure of "sparkle" has been imparted to the negative. By this means the high lights gain in opacity while the half-tones lose, and it is possible to obtain from a flat, poor-printing negative one that gives quite a passable print. When using the cyanide of silver intensifier for this purpose I have obtained excellent results by alternately intensifying and reducing afterwards in a "hypo" bath of rather less than normal strength.

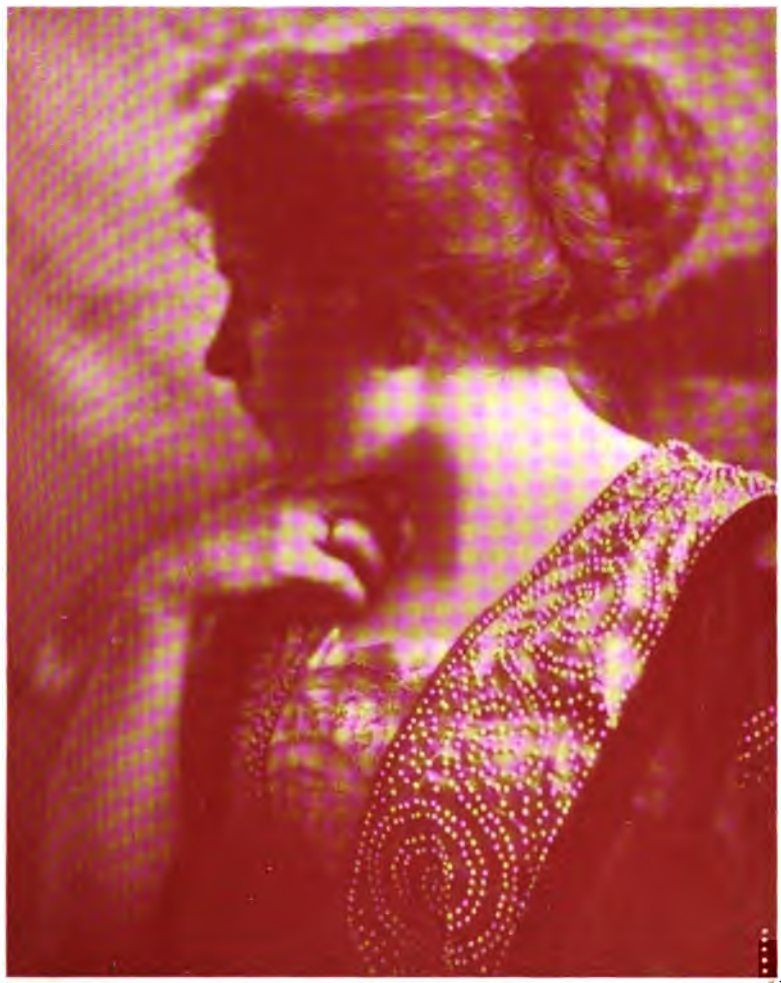


OUR BABY. MISS REINEKE.

With under-exposed negatives, comprised in class 3, quite the opposite treatment is desired. In these it is necessary to strengthen the half-tones without adding materially to the high lights. No intensifier that I am acquainted with will effect this desideratum to any great extent. It is manifestly useless to use an intensifier that acts proportionately on all densities, and it is difficult to find an intensifier that does not so act. Perhaps the one that most nearly fulfills this condition is the uranium intensifier; it certainly is the one best suited for the treatment of under-exposed negatives. The plate requires to be thoroughly freed from the "hypo" bath before intensification is attempted, and it is advisable in order that even action may be assured to soak it for a few minutes in a weak solution of acetic acid. Formulæ for the intensifier are given both with and without acetic acid, but preference should be given to one containing acid to insure even working.

Uranium nitrate	40 grains
Potassium ferricyanide	40 grains
Acetic acid	1 ounce
Water	10 ounces

Intensification must not be carried too far, as the color on drying becomes much more pronounced. After intensification the plate is carefully washed under a *slow running* stream of water so as to induce even washing of the whole surface, and the washing requires close attention; otherwise the color may be completely discharged. The value of uranium intensification seems to depend on the color not being absorbed by the denser portions so quickly as it is by the weaker half-tones. That it is a valuable means of improving the printing quality of under-exposed negatives I am well assured. Suspicions have been raised as to its permanence, and by some it has been pronounced without doubt impermanent. This probably arises from the fact that negatives have not afterward been varnished. If varnished I have found it sufficiently permanent for all practical purposes.



PORTRAIT. Howard D. Beach.



WHAT SHALL I BUY THE BOYS? H. H. BROOK.

FIGURE WORK AT NIGHT

By H. H. BROOK

A PHOTOGRAPH of a street scene in which no figures are present makes a very poor and uninteresting picture, yet if a stand-camera is placed in a suitable position it is possible to give a fast plate a sufficient exposure and include figures, even although, shall I say, we are handicapped with an aperture of F/8. If one is fortunate and possesses a lens of larger aperture—F/4—or, by using a portrait lens, still a larger aperture is at command. It is then quite possible to use a

hand-camera; still with F/8, as I think the illustrations show, some very interesting work can be done.

Of course, the figures which appear in these photos were not posed nor did they know of the camera's presence. The plates used were Barnet Super Speed Ortho (400 H.D.), backed with Primus adhesive backing paper. Although no doubt plates backed by the makers are best, yet this paper stops a great deal of the halation which, in a night scene, will often spoil a picture.

In choosing the views a special note should be made of the areas of shadow, for if the shadows are near the camera and of large size a comparatively longer time of exposure must be given than in the case of a more evenly lighted scene.

Having set up the camera in as inconspicuous a position as possible, you focus on the place you require the figure to occupy. If you have selected a brilliantly lighted shop you will not have to wait long for a person to come who will no doubt soon get interested in the shopman's wares. As soon as the shopper stands still commence the exposure and, of course, keep a close watch, and the moment movement occurs close the shutter. I have been very much surprised at the length of time some people will stand still; sometimes longer than is necessary to get a full exposure.

To prevent bright lights shining into the lens it is as well to wrap a piece of black paper around the lens, and secure with an elastic band. The paper can be torn or bent to any shape required to suit the exigencies of the scene.

Development is largely automatic, for what you expose so shall you develop. In winter you must warm the developer, and for this work rodinal, metol or like developers, used as warm as the plate will stand, will bring out all the latent image and will not build up so much contrast as pyro soda or hydrochinone.



NIGHT SCENE.

Illustrating Article "Figure Work At Night," by H. H. Brook.

THE NECESSARY INSTALLATION FOR CARBON PRINTING

By A. C. BRAHAM, F. R. P. S.

I HAVE been permitted in previous issues of the ANNUAL to discourse on the manifold advantages and excellencies of carbon printing, and to describe the methods found to be most conducive to the sure production of good results.

If, on the present occasion, I were to confine myself solely to the necessary installation as indicated in the title above, my article would bid fair to be as short as the (probably legendary) chapter in the treatise on zoology entitled "Snakes in Ireland": "There are no snakes in Ireland."

I cannot go so far as to say nothing is necessary beyond that to be found in any photographic amateur's outfit, but here in England all that is needed for starting carbon printing is provided by the Autotype Company in a trial set containing all necessary apparatus and material for producing a dozen prints for half a crown. The apparatus, consisting of squeegee and actinometer, is of the nature of plant, the tissue and transfer paper being stock, which is used up and replenished as need arises.

The simplicity of carbon printing is such that to those working in a small way no question need arise as to special arrangements or apparatus required. All that is needed beyond the actinometer and squeegee provided in the smallest and cheapest trial sets is either to be found in the ordinary dishes possessed by anyone practicing photography, or to be borrowed from the presiding household authorities. Their willingness to lend basins or dishes or to permit the use of the bath-room will be the only question to be considered.

Going beyond that which is necessary for carbon printing, I propose to describe arrangements found convenient in practice for those making a more extended use of carbon printing, these arrangements, of course, being controlled by the amount of space available and the quantity of work to be accomplished.



THE MOUNTAIN ROAD. Wm. T. Knox.



The flat squeegee is greatly to be preferred to the roller form, and, made of good, soft rubber, it is very durable. Attention should be paid to the point that when used for squeegeeing on to opals, or for transparencies, it should be an inch shorter than the width of the glass, as, if wider, the rubber edge may be cut or jagged by the edges of the glass.

It is recommended, and is generally found most convenient, to have the mounting-board laid flat, but any slope or angle preferred by the worker will answer. The printers of a very successful Italian firm (whose work is wholly from temporary flexible support) have a zinc plate fixed on the wall and thus squeegee as if engaged in paperhanging. This is only mentioned as indicating deviations possible, not as an example to be adopted.

When large prints or considerable quantities are to be made regularly some special installation is necessary to secure convenience and economy in working.

The precise arrangement will largely be controlled by the space that is available for the installation of the needful sinks or dishes, or, in the case of large work, tin or galvanized-iron tanks. Their size will, of course, be governed by the size of the largest prints it is intended to produce. The tanks should be 12 to 18 inches larger than the largest sheet of paper to be employed. Do not have the tanks set dead level, but have the plug-hole corner low. The used water will then flow out freely and facilitate the cleaning of the tank, for which purpose an old squeegee answers well.

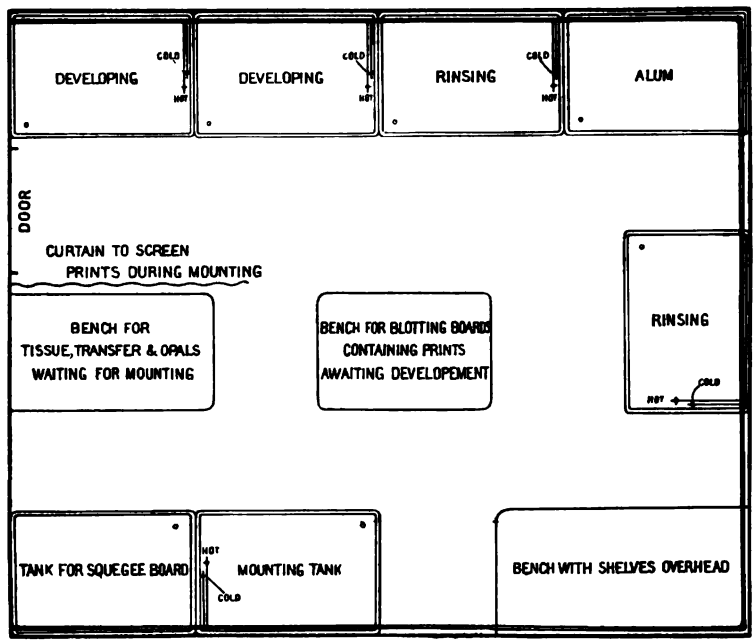
For comparatively small sizes the glazed sanitary scullery sinks are very convenient and cleanly. They will serve for cold water and alum, and, if not too shallow, for development.

One tank will be needed for the cold mounting water; one shallow tray to support the mounting board in, in order that water may not be splashed on the floor when squeegeeing; a second cold-water tank for rinsing the prints after development and after taking them from the alum bath. The alum solution must be kept in a tank either of earthenware or of wood, lead lined. Tin or iron is not suitable for holding alum solutions.

A separate hot-water developing tank will be desirable for each person developing, but the cold-water and alum tanks

will serve for the use of several printers. The cold-water tank used for mounting the exposed tissue, and the mounting board, should be screened from direct light so that the tissue shall not be exposed to light likely to tint it during the operation of mounting.

The developing tank should be placed in a well-lighted position so that the correct depth of the print may be accurately judged. The rinsing tank and alum tank, for convenience, should be adjoining.



Suggested arrangement for developing-room.

The arrangement for a supply of hot water will, of course, be dependent on the quantity required, a kettle, geyser, kitchen boiler or bath supply sufficing in many cases.

If desired, a paraffin stove under the hot-water tank may be utilized, a stove without wicks burning vaporized paraffin (purchasable for about half a sovereign) being convenient when gas is not available; but neither of these, if used for a long time, adds to the comfort of the worker. For larger quantities of water required when work is carried on, on a

big scale, the installment of a special supply may have to be considered and the services of a hot-water engineer enlisted. The hot-water cistern should not be in close proximity to the cold, as in warm weather it is desirable to keep the latter as cold as possible. About 60° Fahr. is the temperature at which the cold-water baths should be maintained both in winter and summer.

The hot and cold-water taps should be fixed conveniently over the tanks, and it will be found useful to fasten a short length of rubber tubing to them. That on the hot-water tap forms a convenient "water brush," as by pinching the end of the tube a spray of water can be directed to any part of the prints requiring to be lightened in development.

Bench room will be needed for waxing the temporary supports, also for the bibulous boards in which prints are placed before development. Shelves for holding racks and other sundries will also be useful.

The drying space for prints is provided overhead, and a convenient plan is to suspend the finished prints by their edges with American clips. These are fastened at intervals to a piece of cord hung from one end of the room to the other. The clips may, if desired, also be nailed at intervals to long wooden laths which are placed in convenient positions in the room.

The illustration of a suggested work-room will, I hope, make clear any ambiguity in my description.



THE PYRAMID AT GIZEH. GUSTAV EISEN.



Figure 2.

YOUNG WATER TORTOISE. A. LOCKETT.

NATURE PHOTOGRAPHY

By A. LOCKETT

WHAT is called nature photography may be defined as the systematic recording of nature in all its aspects, animate or inanimate, by means of the camera. Such work is usually considered more as regards its scientific value or its general interest than from a pictorial standpoint.

Even a cheap box-form hand camera may be pressed into service, but the scope and possibilities of the worker become wider in exact proportion as higher priced and better apparatus is obtained. A long-extension field camera with the usual adjustments and having a good, rigid stand is certainly the most generally useful type. With this a wider variety of subjects may be attempted than with any other. For most purposes a long-focus lens will be best, preferably a large



GARDEN WARBLER. WILLIAM FARREN.

aperture anastigmat; but a short-focus lens is often very serviceable for photographing small objects at close quarters with a moderate extension. A focal-plane shutter is recommended; this should be selected for its quietness of working.

If, however, the subject will consist mainly of animals, insects or other living creatures, a reflex or twin-lens camera is best, owing to the ease with which any movement may be followed on the screen and the focus adjusted up to the very moment of exposure. An exception must be made in the case of wild birds, which cannot be approached closely enough to use a reflex. In photographing these the long-extension field camera is commonly called for, and usually some way of disguising or hiding both apparatus and operator must be contrived unless suitable cover is obtainable. A low-power telephoto lens is frequently useful when the light permits, enabling one to work from a more convenient distance.

If any real pleasure or profit is to be derived some plan or system should be pursued; the making of a number of disconnected exposures on subjects that have no relation to each other soon wearies and disgusts the worker. A definite line of interest should be chosen and followed as far as possible to its legitimate end. This is the more necessary as the different branches of nature photography call for varying treatment and require separate study till the expertness that comes from practice is achieved.

Small reptiles such as the lizard, or amphibians such as the frog and toad, may either be taken in their natural surroundings with a reflex camera, or with a field camera the stand of which is shortened to bring the apparatus nearer the subject. With a field camera one has to be quick in focusing and inserting the slide, or the creature will speedily move out of the field of view. For this reason it is better to capture the subject and put it in a box for a few seconds. A predetermined spot is next focused upon; then, with the plate inserted and the slide drawn, the creature is placed on the ground close to and facing the required position, the exposure being made directly it reaches this.

In a good light the exposure will vary from 1/10 to 1/100 second at F/8. Longer exposures with a smaller aperture are but seldom practicable unless the subject is in a very



JAN HAVLASA, BOHEMIAN NOVELIST. LOUIS FLECKENSTEIN.

complacent and restful humor. But, at the best, such work is tedious and disappointing with an ordinary camera, and many plates will frequently be spoiled before a negative is obtained in which the subject is well placed and effectively posed. The reflex camera, of course, removed most of the difficulty.

While natural surroundings usually give the most interesting photographs, the work is certainly easier if the subject is taken home, studied for a few days in a suitable glass-sided tank, and then placed for photographing in the garden or on a small table outdoors. An artificial approximation to the original surroundings may readily be created with the aid of a few stones, pebbles, rushes, grasses, etc.

The ordinary stand is somewhat inconvenient when working at the table or close to the ground, and it is well worth while to make the simple, yet useful, accessory illustrated by Figure 1. This consists of a wooden box about 4¾ inches high, having a hinged lid, in which a hole is made to take the camera screw. A square wooden plate-box is just the thing. The camera having been screwed on the lid, with the lens nearest the hinges, the box acts as a low stand, the lid as a tilting-table for inclining the apparatus at any desired angle, at which it may be kept by inserting a book or a small wedge between the box and the lid. A better and more permanent arrangement, however, is to attach a slotted brass plate to the lid, as shown, working on a clamping screw, for which a bush is provided in the side of the box.

This accessory will be found extremely helpful, not only for work on the table, but for the photography of low objects, such as flowers, fungi, etc., in their natural environment, enabling the lens to be trained down closer to the subject than can be done even with the shortest stand. Where the box is found too low it can obviously be stood upon any other support to bring it to the necessary height.

The box itself is handy to hold various impedimenta, or, if ventilation holes are bored, it may be used for carrying subjects home. The photograph of the young water tortoise (Figure 2) was taken with the foregoing accessory, using a short-focus lens and slightly tilting the lid of the box.

For photographing fish, newts, water-beetles, etc., a two-sided

glass tank is required, having sides so close together that the subject has little liberty of movement, and so cannot keep swimming out of focus. For small fish the width may be as little as 1½ inches. Such tanks are readily improvised with two sheets of glass of equal dimensions and some stout grooved wood, the glass being bedded in with putty. The front piece, at least, should be of clear plate glass, free from



Figure 1.

BOX TILTING-STAND. A. LOCKETT.

scratches or defects. The narrow tank is, of course, only to be used for the short time occupied in photographing; a larger one should be kept for the fish to live in.

So much has been written about flower photography that it need scarcely here be alluded to, beyond remarking that, except for white flowers, an orthochromatic plate with a suitable screen will be indispensable for truthful results.

Exceedingly good work can be done on the various brands of "non-filter," "anti-screen" or "self-screen" plates. The ex-

posure should be full and care should be taken not to develop too far, as softness is of primary importance. It is difficult to improve upon amidol as a developer, though it has a disagreeable knack of staining the fingers if these are left unprotected, the discoloration refusing to yield to any remedy but time.

The choice of background is of great importance in flower photography and may make all the difference between success and failure; it should usually be of a shade darker than the flowers, but lighter than the leaves. A background is not very often required outdoors, but when something of the kind is imperative to isolate a plant or other object from its surroundings, a square yard or so of white calico or plain cloth of any suitable shade, tacked to a pair of light wooden rollers so that it will roll up for carrying, will prove useful. One end of each of the two rollers should be allowed to project for about nine inches, and these ends should be pointed in order that they may be stuck into the ground if desired.

Last in order may be considered those still subjects which may be taken indoors, such as fruit, minerals, corals, shells, etc. Some nature photographers seem to think that their craft should confine itself to recording the animate creation, but, if there is any meaning in the name they appropriate, this is a self-evident and unscientific mistake.

To make small objects stand out with better effect a few simple backgrounds will be needed, a black, a white and a medium gray shade being most serviceable. For the white background a sheet of stiff cardboard will do very well, while for the black one a piece of black cloth or velvet stretched tightly on a thin wooden frame may be used. The best dark background of all, however, is a rather deep box painted a dull black inside and so placed that the light does not enter. Such a background reflects practically no light, which cannot be said even of the blackest velvet. The medium background may consist of smooth, tinted paper pasted on cardboard and well rubbed down till perfectly even. For most objects these backgrounds need not be more than two feet square. An additional sheet of white cardboard for use as a reflector will also be wanted.

In photographing small, still objects the work resolves



JAMES AND HARVEY. A. D. WYATT.



Figure 3.

HONEYCOMB CORAL. A. LOCKETT.

itself into the comparatively simple matter of supporting the object so that no obtrusive cast shadows occur and of obtaining an effective lighting. In most cases a side lighting is preferable, with the white reflector arranged at the side opposite the light to prevent heavy shadows, and the background about 1½ feet or 2 feet distant.

If a large bay window is available a very suitable lighting is usually obtained by placing the subject on a small table toward one side of the bay, pulling down the middle blind and that on the opposite side to the source of light. With a strong light it is as well to pin up a sheet of white tissue paper in the window, which has a very softening effect. Under such conditions exposures are difficult to judge accurately and are best timed by meter.



Figure 4.

MUSHROOM CORAL. A. LOCKETT.

A convenient support for corals or minerals consists of a box stood upright on its side and having cloth of a suitable shade stretched tautly over it to act as a background, this being fixed with pins or tacks. The box is first laid horizontal and the object is fastened on by means of stout pins driven cautiously in against the edges and disposed to show as little as possible. By taking proper care they are easily arranged so as to be completely invisible to the camera, or at least to show the heads only, which are readily spotted out in the print.

The photographs of the honeycomb coral (Figure 3) and the mushroom coral (Figure 4) are typical of the results that may be secured in this way.

The corals were pinned as described to a black cloth back-

ground, and lit obliquely, a mirror being used to reflect light on the shadow side.

Small, light objects may be held invisibly by making use of a sheet of glass mounted in an upright frame supported on struts or feet. This is stood about two feet away from the background and parallel with it, the object being caused to adhere to the glass by means of a pellet of plasticine. Care must be taken to avoid reflections. This method, properly employed, abolishes all cast shadows. Larger and heavier objects should be placed on a horizontal sheet of plate glass held in any suitable manner a short distance above the background, the latter being laid flat beneath it. The camera is then pointed vertically downward at the object with the aid of a tilting-board.

In conclusion, it may be remarked that the successful nature photographer is one who pursues the work with full sympathy and affection, appreciative of the many wonders that unveil themselves before him and showing kindness and consideration to even the lowest and least attractive forms of life.



SUNLIGHT AND SHADOW. A. B. STEBBINS.



A STORMY DAY. W. A. RUDSTAD.

CINEMATOGRAPHY

By ALFRED H. SAUNDERS
Editor of Moving Picture News

AT the request of the editor of the AMERICAN ANNUAL OF PHOTOGRAPHY to write something for the readers of the ANNUAL, I thought an article on Cinematography would be very appropriate at the present time, as this is a subject that has not been treated upon in previous issues of the ANNUAL. I am not going to give a cut and dried article showing how to take pictures, but only to point out the vast possibilities for enterprising photographers who are willing to make a little sacrifice and a few experiments in their neighborhood.

The moving picture at the present day is in the hands of people who are too busy making money for them to take up local work. I have often been impressed with the idea, and if I were once more in harness I certainly would carry it out to its full limit, namely, the photographing with the cinematograph camera of garden parties, special occasions that may be of more or less family or historical interest. For instance, a gathering of a family at either a reunion or some special event, say a marriage of a son or daughter, or the reception of some important personage in the neighborhood, of which a cinematograph record will be valuable in the years to come as a sort of memento of those who took part therein.

Another idea is the taking of local events connected with the township, either on some special occasion or event that might be taking place at the time. The various manufacturing plants, showing the crowds going to or from work, depicting the employees, which could be exhibited in the principal local theatre, making a special night for the exhibition of the same. These are but a few ideas of what might be done of a general character.

Some photographers are occasionally called upon to photograph horses, probably in a coursing or a hunting party, and a few hundred feet of film showing some of the ladies and



THE BROOK. D. H. Brookins.



gentlemen on their thoroughbreds would be pleasing to those participating in the hunt.

Now, regarding the cost of an apparatus. Many photographers come and interview me, being sent by various photo supply houses, to get an idea how to use a motion-picture camera, the costs and details for fitting up such a plant. Most studios are fully equipped with good dark rooms, and these rooms at a pinch may be made perfectly satisfactory for cinematograph work as a side line.

The cost of a camera will vary. There are many on the market that can be used, notably The Kinora, or Urban Professional, the Prestwich, the Darling, the Lumiere, the Gaumont—all foreign makes. The only one we can recommend in America is that made by C. Francis Jenkins, of Washington, D. C., which is a handy little camera carrying up to four hundred feet of film. Prices vary from $450 down.

Many mechanical helps are manufactured by which two or four hundred feet of film can be developed in a small half-circle tank holding about five gallons of solution, or it may be done in flat trays and developed with special developing formula of the various film makers such as Eastman Kodak Co., Lumiere Film, Raw Film Co. "Afga" and the Austin Edward stock, supplied by the various stock houses handling these goods. The probable cost of an equipment such as I outline for this purpose may total approximately $500, and photographers now getting into this work may ultimately find a market for their product through the various companies who are handling the Weekly Film Newspaper such as the Pathe Freres Weekly and the Gaumont Weekly.

Again, there may be amateur photographers who have the time, energy and money at their disposal, to whom amateur cinematography may prove a very interesting and diverting hobby. We have in mind our friend Williamson Buckman, who traveled to many places in this country and abroad carrying a cinematograph camera with him, which has proved a most interesting hobby and a delight to him throughout his travels.

Another point I would like to bring out is the fact that there are many educational subjects used by the various colleges and universities which a clever local photographer might be able to

produce for the professors, such as microscopic subjects in zoology, botany and other sciences. In fact, the field is unlimited, and where the lantern slide is used today the cinematograph film may be used tomorrow.

I have watched with keen interest during the twenty years of my experience with the cinematograph art its vast and wonderful advances and the rapid strides it has made from mediocre slap-stick joke film to the present-day high art. The possibilities for the beautiful educational advancement are only just being thought of and the smallest fringe being touched, so that readers of the AMERICAN ANNUAL OF PHOTOGRAPHY can realize what they can do by entering this field of progress and research much to their own advantage.



MISTLETOE. NATHAN R. GRAVES.



A ROLLER. DR. G. W. ALLYN.

PHOTOGRAPHING ON WOOD FOR ENGRAVING

By THOMAS W. SMILLIE

Honorary Custodian, Section of Photography, United States National Museum.

UP to about the year 1868 pictures which were to be engraved on wood had to be transferred by hand to the block in a reversed position, and as this work was laborious, the artist who made the original picture generally left the transferring of it to the block to be done by a mere copyist, who was very likely to take a fine spirited original and make a characterless copy of it, and in scientific work often reproducing the subject with such inaccuracy that the illustration when completed was perfectly useless.

This led to the suggestion that the photographer should take the place of the copyist, and various photographic methods were tried, beginning with the carbon transfer which made a beautiful copy in the desired reversed position, but very misleading to the engraver on account of the thickness of the film, then the albumen-silver method which made the wood pithy, next the bromo-gelatine which was with a minimum amount of gelatine fairly successful, but which with the necessary amount of washing caused large blocks to swell and crack.

At this time, acting upon a suggestion in one of the journals that collodion transfers might be used on wood, I tried it, but found that as used at that time it would not do.

I used the process, however, as a basis for experiment, and finally, by adopting the alkaline silver bath, which has little solvent action on the haloides on the collodion surface, making a thick collodion with very little iodide and bromide, so as to prevent the lighter shadows and middle tones from blocking up, thus enabling me to give short exposures and force the development, and in fact doing everything to produce a picture on the surface of the film so that no pyroxylin should intervene between the picture and the block (otherwise the picture



CHILD PORTRAIT. **Belle Johnson.**

would be carried away when the film was dissolved), I finally perfected the process and produced a picture of exquisite delicacy, having no more body than a pencil drawing upon the wood. This is the process which has been in use in the Smithsonian Institution since 1869.

For fifteen or twenty years I prepared nearly all of the illustrations for the Smithsonian Institution and its bureaus in this way, and also for several of the government departments, but when the cheaper photo-engraving processes were perfected they supplanted wood engraving, and this method dropped out of use.

Now that there has been a revival of wood engraving I have thought that the publication of this method might benefit those interested in such work. I will begin with the silver bath, which should be prepared in the following manner:

Water	100 c.c.
Nitrate of silver	8 grams
Iodide of potash	2 decigrams

Add oxide of silver, stirring until an excess remains undissolved, then set in the sun for five or six weeks, when it should be taken in and decanted. This is called an alkaline silver bath and must not be acidified.

COLLODION

Alcohol, 95 per cent	60 c.c.
Sulphuric ether	40 c.c.
Ammonium iodide	7 decigrams
Ammonium bromide	2 decigrams
Pyroxylin	1.5 grams

DEVELOPER

Water	100 c.c.
Ferrous sulphate	2 grams
Glacial acetic acid	13 c.c.

TONING BATH

This should have an acid reaction.

Water	100 c.c.
Gold chloride pure	2 decigrams

FILM SOLVENT

Sulphuric ether	100 c.c.
Alcohol	50 c.c.

Obtain plate glass without scratches and immerse in nitric acid, then wash and set it in a rack to dry. Take a negative of the object to be engraved, place it in the window as if to make a transparency except that the glass side should face the lens, coat the glass with the collodion and immerse in the silver bath just long enough to sensitize it. Expose in the camera as for an ordinary transparency, develop until all detail appears by reflected light, but keep the whites perfectly clear, wash thoroughly and fix in

Water	1 liter
Cyanide of potash	10 grams

Wash thoroughly and tone through to the glass with the before-mentioned gold solution and wash and place the plate in water acidified with sulphuric acid. This will loosen the film. When free from the glass, raise it up, holding it in place on the plate with the thumbs and rinse under the tap.

Place an ordinary glass now in a tray of water, turn the picture down upon this and allow it to float off the plate glass.

Center the film now on the glass in the water, raise the glass up, holding the film in position with the thumbs, now take a piece of thin paper, immerse it in the water and lay it down upon the film.

We will suppose that you have in the meantime coated the block with flake white with just enough Heinrich's gelatine to make it adhere to the block. This will be enough to make the picture also adhere.

Raise the paper up now with the film upon it and lower from one side upon the block in such a way as to exclude air bubbles.

Put a piece of moist blotting paper upon it and place in a letter press and put the pressure on for about two minutes, then remove it, strip the paper off in such a way as not to lift up the film and remove the surplus film from the edges and turn the block face down in the mixture of ether and alcohol; this will remove the pyroxylin and leave the image on the wood.

This process also makes an exquisite collodion transfer on paper.



THE VIGIL. HARRY D. WILLIAR.

IMPROVING THE DISTANCE

By A. W. H. WESTON

ONE of the charms of a good picture is the way in which the different planes of distance are suggested, enabling one to say of the object depicted "that is in the far distance," "that is in the middle distance," or "that is closer still," this difference being borne to us partly by perspective, and partly by that subtle factor "atmosphere."

If the subject is a portrait and natural scenery forms a distant background, it is important that this should be rendered with due softness to convey this suggestion of distance; the distance should really appear in the distance and leave the portrait in its proper plane. When one can manage this naturally happy is he, but natural backgrounds are usually troublesome to render, and by being too assertive often spoil an otherwise successful portrait.

A negative that transgresses in this respect can often be improved in the following way. The method is simple, and has the advantage that it is not necessary to tamper with the negative itself.

A P. O. P. print is first taken from the negative, and from this the background portion is entirely cut away, leaving only the figure portion of the print; or in a case like the illustration shown where the sea was rather too subdued, and of too high a tone even for the distance, then this portion of the print is not cut away but left attached to the figure portion. This portion is then carefully attached as a mask to the glass side of the negative, exactly shielding the portion shown in the print. The next stage is to make a transparency from the negative on a slow, dry plate. This must be done in a slow light, and behind two or three thicknesses of tissue paper to assure good diffusion. The frame must be moved about slightly to avoid a hard line from the edge of the mask, and also precaution must be taken to secure the proper gradation of distance.



Figure 1.
Illustrating Article "Improving The Distance," by A. W. H. Weston.

It will be obvious that if a transparency were printed straight from the negative, the figure and near object only being protected by the mask, everything behind the figure would be treated the same; whereas, the distance must be gradually subdued as it recedes from the figure. This is easily achieved by vignetting with a piece of card while printing the transparency, slowly moving the card up and down over the portion where the vignetting is to appear, and thus it is advisable to print in a slow light so as to allow time for this manipulation.

In developing the transparency only a very weak image is required, and it is easy to over-do it. It will perhaps be necessary to do two or three before a quite suitable one is obtained, but as the process is easy it is well worth the trouble.

When a suitable transparency is obtained and the same fixed, washed and dried in the usual way, it is bound up together with the original negative (film to film), with lantern slide or passepartout binding, when care must be taken to exactly superpose the two images.

If all this is carried out properly the background which was formerly too assertive will be gently subdued and show a pleasant suggestion of "atmosphere" between.

The composite negative cannot be printed in the ordinary way, unless indeed the transparency is made on a film, but the best way to print it is through a lantern when, of course, it may be enlarged, reduced, or reproduced original size.

The difference that the compensating transparency makes will be noted in the two illustrations given here (Figures 1 and 2). In the one which is from the untreated negative (Figure 1), what was really a pleasant line of rocks in the distance appears almost like a branch, projecting awkwardly from the tree behind. In the other (Figure 2), which has been treated in the way described the figure stands more free and claims our first attention, while the distance we subdue takes its proper place and "lends enchantment to the view."



Figure 2.
Illustrating Article "Improving The Distance," by A. W. H. Weston.



A BREAKER. C. F. CLARKE.

THE USE OF A RAY FILTER

By ARTHUR K. CURSON

THE object of this article is to give in a concise and simple manner the true function of a ray filter in its relation to the action of light on a photographic dry plate.

There is nothing abstruse about the proposition, a ray filter works just like the piece of chamois in the bottom of the gasoline funnel. It passes certain useful things and holds back certain harmful things.

Sunlight is a good deal like petroleum. It is composed of many separate and distinct elements all mixed together.

As petroleum is composed of kerosene, benzine, gasoline and many other kinds of oils, so is sunlight, or white light,



MORNING LIGHT THROUGH THE REDWOODS. **Edgar A. Cohen.**

composed of red, orange, yellow, green, blue and violet lights.

These various colors are specially emphasized because red sunlight is always red, green sunlight is always green and so with all the other colors composing sunlight. There is no possible way of changing green or violet, or any other primary color, into red or yellow or anything else. They are always the same and always have their same chemical properties until they are dissipated in space or extinguished by absorption.

Therefore a yellow ray filter does not change any of the other components of white light into yellow, but simply blocks out, absorbs or extinguishes, enough of the violet and blue, so that the remaining mixture of red, orange, yellow and green produces the color sensation of yellow on the eye.

But why should we block out the blue and violet? It is simply because photographic dry plates are enormously more sensitive to violet and blue than to the remaining four colors.

There is also an invisible light accompanying sunlight called the "ultra" violet, from the fact that in a rainbow or spectrum it is found "beyond" the violet. Photographic dry plates are strongly sensitive to this non-luminous ultra-violet light also, and the yellow filter should absorb this entirely as well as most of the violet and blue.

Ordinary dry plates are scarcely sensitive at all to red, orange, yellow and green.

Orthochromatic plates are not sensitive to the red and orange, but are a little sensitive to the yellow and green. They are, however, forty times more sensitive to the blue, violet and ultra violet than they are to the yellow and green.

Panchromatic plates are sensitive to all colors, one-sixteenth to the red and orange, one-sixteenth to the yellow and green and seven-eighths to the blue, violet and ultra violet.

In addition to this glaring deficiency in photographic dry plates as regards sensitiveness to various colors, it is very necessary to consider the brightness of the colors as well. The scale of brightness or visual luminosity runs as follows: White (all colors), yellow, orange, red, green, blue, violet, black (absence of color).

In this scale the yellow color, which is first in the primary or single colors, is fully thirty times as bright as violet, the darkest color.

When we have a thorough understanding of the color sensitiveness of plates, and the great difference in visual luminosity of the various colors intended to effect these plates, we are in a position to understand the situation confronting us in orthochromatic photography.

Orthochromatic (correct color) photography means simply this: the production of photographs in light and shade that correctly portray the relative brightness of objects as seen by the eye.

Orthochromatic photography has nothing to do with actual color production, but simply aims to produce *light* colors, *light* and *dark* colors, *dark* with all the intervening shades in halftones.

Suppose we photograph a young lady in a bright red dress carrying a deep blue parasol. A print from the ordinary plate would show the young lady in a black dress carrying a white parasol. Exactly contrary to fact. By the use of panchromatic or even orthochromatic plates and a good ray filter the blue may be so subdued and the red, orange and yellow reflected from the red dress, so accentuated that a faithful record of the relative brightness of the colors may be obtained. From the super-sensitiveness of every kind of plate to the blue, violet and ultra violet, it is readily understood that neither panchromatic, orthochromatic nor ordinary plates are of any practical value in orthochromatic photography, unless they are used with a ray filter. Without a ray filter the enormous excess of sensitiveness to the darker colors completely loses any little effect of the bright colors. Therefore, *a good ray filter is absolutely essential.*

Now that we have the orthochromatic situation before us as regards light, plates and filters, we are in a position to form a definite idea of what we need in practice to obtain pictures of correct visual luminosity, or eye brightness, and can get at the best way of handling different subjects.

Nearly all amateurs using ray filters are after cloud effects in landscapes, and about ninety-nine per cent of those using the ordinary filter obtain just as many clouds with the filter as they would without it.

To explain: Suppose we take a landscape with trees and shrubbery and grass in the foreground and a beautiful Sum-



BETHESDA FOUNTAIN IN WINTER
(CENTRAL PARK, N. Y.)

CHARLES M. CONLON.



OCTOBER SUN. G. CASTRUCCIO.

mer sky full of fleecy white clouds occupying the other half of the plate. From your own personal experience, how much brighter would you judge the darkest part of that sky is than the brightest part of the trees and shrubbery? This, of course, is a varying quantity, but in the ninety-nine per cent of cases referred to above the darkest part of the sky is burnt black on the plate before the brightest part of the foreground is fully exposed. In the print you get that blank white sky as a matter of course, ray filter or no ray filter. In fact, *cloud photography is about five per cent ray filter and ninety-five per cent reduction of the excess sky illumination.*

There is only one filter that I know of that any amateur can use with uniform results for good cloud effects, giving a fully exposed foreground and throwing the full retarding and orthochromatizing effect on the sky where it is needed. This filter is the Royal Foreground Ray Screen (manufactured by George Murphy, Inc., New York).



GEORGE MAC DONALD, M.D. B. J. Falk.

This ray screen may be used for snap shots, as it does not retard the exposure at all in the foreground.

The innumerable moving objects, such as water, cattle, rustling foliage, etc., etc., that add so much to the character of the landscape are thus easily photographed with a beautiful natural cloud effect.

In my hands this filter has proven to be extremely useful for indoor portraiture also, in screening out the excess light from side windows, and still giving the speed so necessary.

For subjects of general coloring, such as oil paintings, lithographs, flowers, jewelry, etc., a filter of continuous color is required. This filter should be deep enough to absorb the excess violet and blue and all of the ultra violet. Ordinary plates are worthless for such subjects, owing to lack of sensitiveness to all of the colors except blue and violet, but orthochromatic plates, with a good eight or ten times filter, give very good effects. A light filter five or six times may be used to advantage with the panchromatic plate, as it is proportionately more sensitive to the brighter colors.

By all means I do not wish to disparage the use of the three or four times filter, as the results are infinitely superior to no filter at all, and in many cases the long exposure required by the eight or ten times filter is not only inconvenient but impossible.

To obtain a good orthochromatic effect the deeper shade of filter is, however, much to be preferred.

You may easily prove your own ray filter out yourself by making notes of the comparative brightness, visually, of two or more prominent objects in the subject and then comparing them with the same objects in the finished picture.

Over-correction or under-correction is very simply ascertained. If your bright colors are too dark and the dark colors too light in the picture, then your ray filter is too light and the sensitiveness of the plate is under-corrected and vice versa.

CONSERVATION

By CHARLES E. FAIRMAN

I DO not know as I am quite certain as to the correct definition to be found in the latest dictionary of the word, Conservation, but I have a very definite idea concerning the use I wish to put the word to in this instance, and that is to use it as a word typifying a saving of waste.

There are many well recognized crimes and misdemeanors duly classified in codes and statutes, but there is one act of which the law seems to take no cognizance, and that is the act of willful waste.

Just around the corner from the well stocked photographic supply house you will usually find the thrifty second class store, or more properly second hand store, and here you will find apparent bargains in cameras and photographic paraphernalia, all of which illustrate the sinful waste that is going on and on year in and year out by the buyers of photographic goods who have more money than judgment.

I am willing to admit that some of the second hand goods may have been discarded by those who were able to purchase better and more modern equipment, but by far the larger portion represents hopes that have failed, expectations never realized, and more than this, and the saddest of all, the fact that so many have become discouraged and joined the large majority—the quitters.

The dreamer, and the picture maker might present in some adequate manner the world of possibilities represented by the long shelves of second hand cameras, but to the practical, matter of fact person, there is something pathetic in the array of material wasted, and the loss of money represented.

Is it worth the while to attempt to save this wasting of good apparatus, and this general abandonment of an art-science worthy of the serious consideration of all classes?

The task may be too great for one to hope to accomplish,



PORTRAIT OF AN ARTIST. HAROLD CAZNEAUX.

and the result may seem to be not worth the effort of concerted action; but some day this habit of waste will assume such proportions that manufacturer, stock-dealer, and the photographic fraternity in general, will feel the influence and the depression of the bargains at the shop of the second hand man.

In other words, the display of the second hand dealer is a continuous argument that photography is a matter which is losing its hold upon the people, and if it cannot hold those who give it trial, why need the newcomers make an effort to master its mysteries?

Conservation as a saving of waste in this direction is the need of this photographic condition.

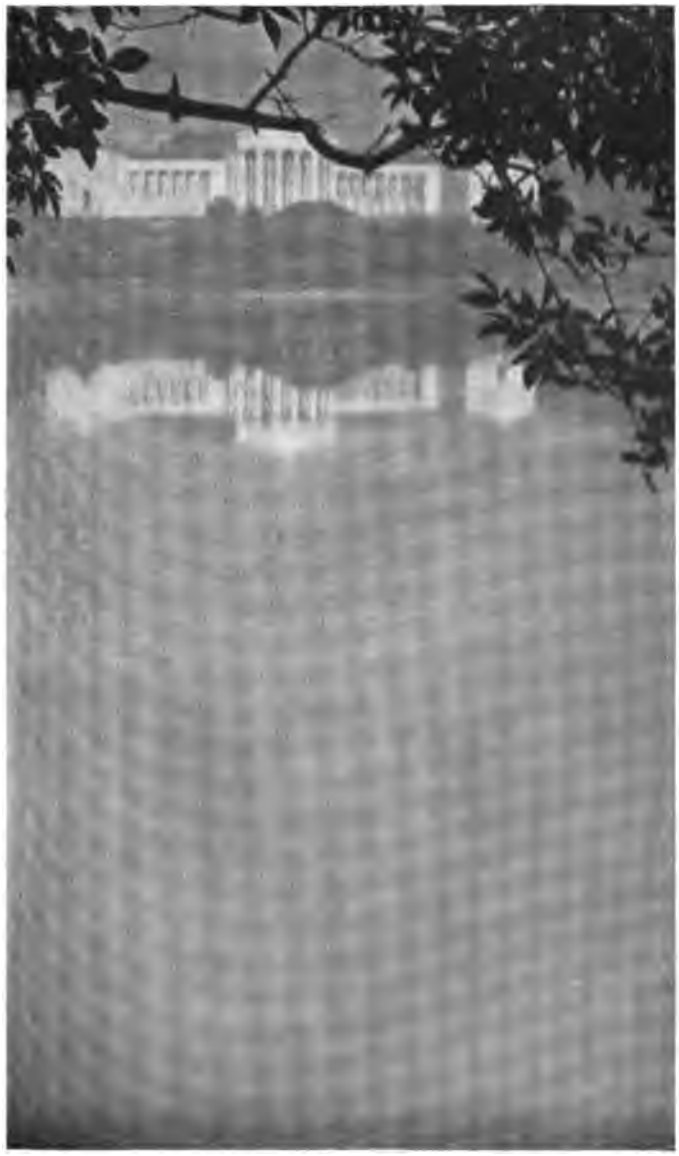
The reasons for all of this abandonment of a pleasant pastime, and scientific diversion, are many. Back of it all may be seen in a large measure the selfishness and indifference of those who have been in a position to help instead of embarrass.

The chance of the checking of all of this photographic waste is very remote, and the possibility of eradicating it entirely is very doubtful, but much of the loss can be averted by keeping in mind the fact that if some relief is not secured, the trade of the second hand man will soon swallow up that of the first hand man.

Much of the abandoning of the practice of photography is due to the lack of success of those who commence this fascinating work. Often it is the fault of some one who knows refusing to help over the hard places. Again it may be due to the short-sightedness of some dealer or manufacturer driving a sharp bargain and imposing upon the trust of an ignorant person. This is of itself sufficient to disgust the beginner and drive him to the second hand man for the purpose of getting rid of his camera and other equipment.

It is too true that the attitude of those learned in the art towards those who are novices is such a discouraging feature that the novice, possibly too sensitive, decides that he has no special gift for this work, drops out quietly, and the camera helps to swell the stock of the second hand dealer.

I am not pleading for the overthrow of the second hand man, for I enjoy gazing at his array of bargains. I am not espousing the cause of the manufacturer or the stock dealer.



ALBRIGHT ART GALLERY. WILBUR H. PORTERFIELD.
Decorative Study.

They can probably manage their affairs much better in their own way than by following my suggestion. I am, however, pleading the cause of those who have tried, and have fallen out of the photographic habit, and am asking that you, Mr. Successful Amateur, and you, Mr. Well-to-Do Professional, and you, Mr. Thrifty Stock Dealer, and you, Mr. Wealthy Manufacturer, will all bear in mind that the greater the number of those who *succeed* in photography, the greater will be the number of the new amateurs who will purchase your cameras, your plates, your papers and your chemicals.

The greater the sales the greater the profits, and the greater the profits the greater the dividends, and so it is a problem for all, and in the helping of the faint hearted we may help ourselves with the reflection that we have tried to make some one's burden easier, and some one's day brighter. In the doing of these things we will define for ourselves the meaning of Conservation.



A NEST OF WILSON THRUSH. L. F. BREHMER.



HOME PORTRAIT. WILLIAM GILL.

NOTES ON THE HYDRA PLATES

By MALCOLM DEAN MILLER, A. B., M. D.

DURING the summer of 1911 the photographic world was overwhelmed by the information that over-exposure had been abolished by the discovery of the action of hydrazine. Mr. W. H. Caldwell, the scientific head of the Paget Prize Plate Company, had been for a long time investigating substances which he hoped would act as binders for nascent bromide, which, according to the theory of leading authorities, is set free in the sensitive film by the action of light on silver bromide.

Without going into the chemistry of the problem, it is sufficient to state that exposures in excess of a certain maximum produced so much free bromide that the normal process of development could not take place. Or, in other words, the action of light undid itself and instead of producing a denser deposit in the more exposed portions gave a thinner one. This property of gelatine-bromide emulsions made it necessary to secure technically correct exposure for two reasons: first, to register correct values or differences in gradation between the tones of the subject; and second, to avoid the untrue rendering which inevitably resulted from exposing for very dark shadows when the lights were very bright. The old rule, "expose for the shadows and develop for the high lights," was applicable to ordinary subjects, but failed when the exposure necessary to register shadow detail was too great for the highest lights. The saving grace, however, lay in the latitude of the plate, which, in the case of a good emulsion, might run from exposures half normal to ten times normal without flattening the natural contrasts by partial reversal of the high-lights.

It was stated that the addition of certain derivatives of hydrazine to the finished emulsion conferred upon it absolute immunity to over-exposure. In other words, any time what-



THE CLOUD. DR. MALCOLM DEAN MILLER.

(Wollensak Verito lens F/5.6; ¼ sec. exposure; Def. D. C. ortho. plate, with Cramer Ios. filter II.)



Figure 1.
(Correct Exposure on an Ordinary Plate.)

soever could be given without producing reversal of the image. Exposures which with ordinary emulsions yielded positives instead of negatives could now be made, and the only point the user had to look out for was to give time enough for the shadows.

Illustrations were printed showing the sun in landscape views—probably the most extreme test which could be devised. In short, the public was led to expect that the hydrazine plates would solve forever the exposure problem. In this, I confidently assert, the public is not deceived. The new plates accomplish in a perfect manner everything they are stated to perform.

The Hydra plates were placed on the English market in the early summer of 1912. I was fortunate enough to obtain some at once and put them through all the tests I could devise in the endeavor to prove, or disprove, their value and the accuracy of the statements published about them. Setting aside for the moment the extreme subjects, I tried moderate "over-exposures," because I have found that even double-coated orthochromatic plates sometimes lack the power to preserve



Figure 2.
(Twenty Times Normal Exposure on a Hydra Plate.)

the full range of tones when deep foreground shadows contrast with open, sunlighted reaches. It seemed to me that the Hydra plates should prove ideal in such cases, because a straightforward exposure for the deepest tones could be given without fear that the lights would be thinned and flattened.

I chose a subject with willow trees and open meadow, the lighting being from behind the trees. I tested the light in the shade of the trees, holding the Watkins Bee meter to face the camera, and found that the detail in the trunks would require 1-2 second at *f*/6.5 on a common plate of the same rapidity as the Hydra (200 H. and D.). I gave this exposure and then took a Hydra plate of the same subject with an exposure of 10 seconds, or 20 times normal. The result surpassed my expectations.

The first negative was allowed to develop a little too long and was rather hard, though well suited to "professional" gaslight paper; but the time was as accurate as only the meter can make it (Figure 1). The Hydra negative was developed in the same trayful of Paget formula pyro-soda with bromide and taken out when the principal high lights came through to

the glass. Printed on the same grade of paper as the first, it gave a softer and more harmonious print, with values in the greens as good as though it had been made on an orthochromatic plate through a ray-filter (Figure 2). On a sheet of "normal" paper it gave a print which could be distinguished from the other only by close observation. In other words, it was evident that any outdoor subject could be timed without regard to the high lights and still yield a perfect negative—a result hitherto impossible.



Figure 4.
(Prolonged Exposure on a Hydra Plate.)

The importance of this application of the new plates will be at once realized by pictorial workers. Take, for instance, one of the soft-focus lenses, such as the "Verito," which gives just the results one desires at *f*/5.6 (Figure 4). The Studio shutter with which it is equipped will hardly work faster than 1-5 second, yet this is too much time for many subjects if a rapid plate is used. With the Hydra plate it would not make a particle of difference how long the exposure lasted, and a bulb exposure of reasonable duration could be given with the certainty of securing a fine negative. On the other hand, with ordinary plates one would have to stop down and lose the

sketchy effect of the large aperture or else resort to slow isochromatic plates and a deep ray-screen in order to avoid overtiming.

Another obvious application of the new plates is to interiors. Most workers know the tremendous difference between the times needed for the view outside of a window and for the shadowy corners of the room; and though passable results have been obtainable with double-coated, backed or "Isolar" plates, some subjects have remained impossible. With the



Figure 3.
(Flatness from Overexposure and Reversal of Sun.)

Hydra plates one can time for the deepest shadows and retain the exterior unmarred by halation. This is due to three things: first, the fact that only the grains which have been acted on by light are developed—no spreading to unaffected particles, as with common plates; second, the perfect qualities of the Paget Invisible Backing; third, the grainless structure of the image, rivaling the wet collodion process in this respect.

Passing for a moment to screen-plate color photography, one is led to speculate on the advantages of a panchromatic hydrazine emulsion. It is well known that with Autochromes the exposure must be within five per cent to ensure passable results,

and that the slightest overtiming washes out the colors in the high lights because of partial reversal and the dissolving away of too much of the negative image. The hydrazine emulsion would allow practically any exposure over a fixed minimum to be given. It is said that patents have been granted for a roll-film having a ray-filter on the face and the screen on the back of the celluloid, with the emulsion coated on this. Think how advantageous it would be to make the coating fool-proof by incorporating the hydrazine! To me it seems that this discovery of the Paget company's opens up almost unlimited possibilities, and I consider it quite the most important advance in photography in recent years.

The manipulation of the Hydra plates is simple. If the exposure is known to be within forty times normal, a regular pyro-soda with bromide can be used. The contrast of the negative may be controlled by altering dilution and temperature; dilute, warm solutions giving soft results. For times greater than those just mentioned a special developer containing hydrazine is required, and this may be used concentrated and ice-cold if the exposure is 5,000 or 10,000 times too great.

Some notes on the illustrations may be of interest. Figures 1 and 2 have already been sufficiently explained. Figure 3 was made at 6.12 P. M. in June at *f*/16.5 with an exposure of two seconds. The disc of the sun is reversed and all the tones suffer from partial reversal. Figure 4 was made on a Hydra plate at 6.16 P. M. with an exposure of ten seconds at the same aperture. The visual impression is accurate and the sun is not reversed. Unfortunately the halftone fails to give the full scale of the print and the print itself does not bring out the sun quite clearly.

Figure 5 represents an exposure of two minutes at *f*/16.5—sufficient to print out the flame of the arc lamp on the surface of the plate! As far as that goes, one can use the same batch of the hydrazine emulsion for bromide, gaslight, or P. O. P. at will, developing or toning just as the fancy takes one. It is hoped that these plates will soon be available on this side. I am sure that when they are the readers of the ANNUAL will find them capable of solving every exposure problem except that of under exposure, though that, too, can be solved with hydrazine emulsions by giving time exposures instead of snapshots.



Figure 5.

A 5 AMPERE ARC
ON A HYDRA PLATE.

Illustrating "Notes On The Hydra Plate," by Malcolm Dean Miller, A.B., M.D.

LARGE FILM CAMERAS

By H. W. HALES

IN looking around among the professional photographers one can hardly escape being astonished at the total dis-use of the film cameras of any comparatively large size—notwithstanding their great saving of weight and bulk compared with glass plates. I am well aware that most professionals do not like films as a rule, but it seems to me that under some circumstances they can be made extremely useful.

There are many portrait artists, for instance, who travel long distances and often to out of the way places where carrying glass plates is not only a real hardship, but often practically impossible. In these cases a film camera of large size would often prove a real boon. The absence of these cameras from the market may possibly be accounted for by the fact that they have been patented, and, therefore, could only be made by one firm. This firm has had practically a monopoly of all film cameras and no one else could sell them. The expiration of this patent, however, now leaves an open field, and I should not be surprised if large film cameras shortly came into frequent use.

In regard to sizes, would say that for ordinary work a camera making a picture 4½ x 7 inches would make a very good one for general use, for larger work 5 x 9 inches would be an excellent size and for still larger a 7 x 11 film could be used. The sizes mentioned are of artistic shape, either for landscapes horizontally or for portraits vertically, and as the trimming of the prints need be slight the running expense would not be so large as at first thought. The first size mentioned would probably take the place of the cabinet, or 5 x 7 plate. The second is well adapted to marine or long landscape views, while the last size mentioned practically takes the place of an 8 x 10 plate, and is a more artistic shape, as it is not so nearly square.



HARVEST MOONRISE. **John M. Whitehead.**



These cameras could also be constructed to take any portion of the film desired, and even to take several small pictures instead of one, hence they could be made to be almost as economical as glass plate cameras, and there is an apparatus now on the market by which panoramic views can be made the full length of the film roll, thus making a very good all around apparatus.

I am aware that sensitized emulsions will not keep quite as well on a film of nitro-cellulose as they will on a glass plate, also that the films require more care in developing and handling, but notwithstanding all this, their advantages in other ways largely help to counterbalance this, and they certainly ought to find a place occasionally with the professional. While on the subject of developing films, I would call the earnest worker's attention to the advantages of pure metol instead of a mixture of hydroquinone and metol. It not only gives finer detail, but if used of a sufficient strength it has a tanning effect on the gelatine which is extremely useful in preventing frilling.

By using an acid fixing bath all straining of the gelatine is avoided, and the negatives always have snap and brilliancy when properly exposed and developed, so much so that the difference is apparent at once to the expert operator, and is well worth the little extra trouble to obtain.



JUNE. KATE MATTHEWS.

KALLITYPE FAILURES

By JAMES THOMSON

THE iron salts are of considerable importance in photographic printing. The beautiful results obtainable by their use are to be seen in Platinotype and Kallitype, the provisional image in these methods of printing being provided in main by ferric oxalate. Ferric oxalate thus is the basis upon which the Kallitype image is built; hence the importance as regards the condition of same when we use it, and the quality thereof.

Many are the failures in the working of Kallitype, and the generality of them undoubtedly due to deteriorated ferric oxalate. The worker buys an ounce or two and proceeds to make up solution in accordance with some particular formulae, perhaps meeting with entire success, as pictorial results may testify. The next time he attempts it he may meet with failures more or less absolute, and is consequently completely nonplussed as to the reason. Once the bottle is opened an element of danger enters. The chemical is very susceptible to atmospheric conditions, and when the air is moist is quite likely to absorb dampness. Then again, the worker may be careless in keeping the bottle uncorked, or in being unduly long in returning the cork to its place. To trifles such as these is due many a failure.

But not always is the worker to blame. Many a time is the salt worthless when handed over the counter to the unsophisticated buyer. Nor is the seller always to blame; most often is he ignorant of the facts.

My practice since I discovered the importance of it is to at once remove the flimsy shaved corks from the bottles as I buy them. These shaved corks are entirely useless to protect, as they not infrequently shrink so that they can easily be pushed entirely into the bottles. I substitute paraffine soaked corks of the usual kind, then house the bottles in a large screw



WINTER SUNSET. CLEO S. BOURGEOIS.

top preserving jar. Thus have I kept ferric oxalate in good condition for years, the last few grains being in as perfect condition as were the first.

When the worker in Kallitype has trouble in getting the ferric oxalate in prime condition, I should advise sending to headquarters. Send to Merck & Company, 45 Park Place, New York City. Enclose in your letter a dollar bill, or a postal order for same amount, and receive in return your money's worth of good chemical.

The ferric oxalate per ounce costs about 16 cents and the postage, but as they are wholesalers, I doubt if they want to trouble with amounts less than a dollar. Order four ounces, and if there is a surplus after that is paid for, stamps will be sent you with the receipted bill.

Ferric oxalate when in prime condition comes in glistering greenish brown scales, each individual scale separate from its fellow, with no suggestion of mealiness. On the other hand, when stale it is a light green, has lost lustre, the scales are falling to dust, and the mealy condition brings an inclination to stick to the sides of the bottle. In this last described condition, the salt has undergone a chemical change and is no longer ferric but ferrous oxalate. To a ferrous condition is the coated paper reduced when we expose it under a negative in the usual manner. When good ferric oxalate is used to coat paper the resultant image is beautiful, the whites pure. When deteriorated salts (ferrous oxalate) is employed we get a more or less dirty image, the whites being degraded.

When I became a worker in Kallitype, I did not know the good salt from the bad. Excellent results followed my first endeavor, but when I sought for a repetition I ignominiously failed. A study of Captain Abney's book "Platinotype" put me on the right track, so when the most reliable chemist establishment in Boston next time sent me four ounces of stale and chemically altered oxalate, I was prepared to handle the case which I did in vigorous fashion. A year later came a repetition when investigation revealed the fact that there was but a single ounce of ferric oxalate upon the establishment's shelves that was in perfect condition, though they no doubt were selling from the worthless stock every day. At any rate they tried it on me.



PORTRAIT. Rudolf Dührkoop.

HOME PORTRAITURE—SIMPLE WINDOW LIGHTING

By ALICE LILLIAN BECHT

IN the portraits accompanying this article, an endeavor has been made to show different lightings obtainable with a simple home window, and prove that a "Home Portrait" need not be the garishly lighted affair so often seen. Almost any effect of lighting may be secured.

If a photographer learns with a "Studio" light, he will be much hampered if he essays a "Home Portrait," especially until he has learned to conquer the many difficulties that have to be met. A person beginning photography with only a home window to light him on his way, meets all the difficulties immediately, takes them philosophically, and works in spite of them; he has never seen the *easy* side; never knew about lots of light (even on cloudy days), light walls, handy backgrounds and reflectors on wheels, so easily adjusted to any angle desired, and that almost instantaneous exposure that gets everything; even a rebellious baby.

As a "Home Portrait Taker" I have encountered almost every conceivable condition: Well lit rooms; glaring conservatories; small dark rooms and halls; small corners where you can hardly find room for your tripod's legs, let alone your own, and places where you have to almost literally stand on your head in order to see the subject on the ground glass. Then again some rooms are met where the flowered papers fairly scream at you, and though the room may be most desirable in every other way, that paper would be impossible as a background. In such a case place the subject as far from the paper as possible, so as to throw the design out of focus, blurring it.

Many people want an acknowledged "Home Portrait" with the Home accessories in evidence: A favorite chair or window seat, fireplace, etc., while others wish a portrait with "Studio" effect.

All the accompanying illustrations required different han-

dling, and they are all strictly "Home Portraits," in that they were in every instance taken at the sitter's home, utilizing just what each home provided in the way of draperies for the windows, or screens, or sheets for reflectors and to cut out light. A "Home Portrait Taker" will see at a glance THE spot for a picture, and realize instantly its possibilities or limitations.

Most ladies of the "Castle" will be only too anxious to assist you by bringing out old draperies reposing in a dark closet, hunting up low stools, and getting screens, etc. Use tact *and* ingenuity; this latter is the primary requisite in the securing of a good picture under bad conditions; the "Artistic

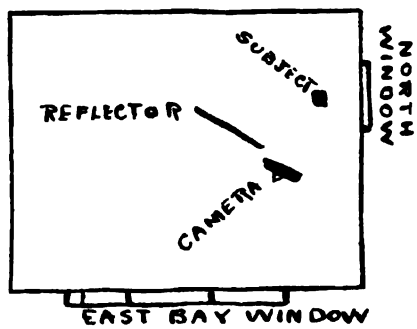


Figure 1.

Instinct" is as naught unless accompanied by the ability to put every obstacle under.

Move furniture; use screens to hold as many sheets as needed to give light; pull down shades to exclude light when desired; use a small table or even chair where the tripod cannot be squeezed in; in fact, do anything that your wits can devise to carry out your inspiration. The idea of the picture, once formed, if it is good—carry through.

The portrait of "Mrs. L.," Figures 1 and 2, is an example of "Studio Lighting"; the room in which it was taken was a small library, dark red paper; bay window to East—single window to North; pulled white shades down in bay to give general, diffused light; placed subject on low stool at north window; lower half of window covered with towel; one corner of towel raised to give strong side light, sheet, as reflector, placed close.



Figure 2.

MRS. L.

Illustrating Article "Home Portraiture—Simple Window Lighting," by Alice Lillian Becht.



Figure 4.

MISS D.

Illustrating Article "Home Portraiture—Simple Window Lighting," by Alice Lillian Becht.

"Miss D.," Figure 4, was taken on a cloudy morning in a room papered in dark brown—ecru ceiling; double window at the North; single window at West; subject sat on lounge, right shoulder (at a slight angle) to large window; lower half of window screened with cheesecloth; sheet reflectors placed close, screening light from West window.



Figure 5.

SISTERS.

Illustrating Article "Home Portraiture—Simple Window Lighting," by Alice Lillian Becht.



Figure 6.

MRS. A.

Illustrating Article "Home Portraiture—Simple Window Lighting," by Alice Lillian Becht.

"Sisters," Figure 5, was taken in a large, well-lighted music room; yellow wallpaper; window directly back of the subjects screened with cheesecloth; reflector used hanging parallel with their bodies.

"Mrs. A.," Figure 6, proved a very good subject under poor conditions. Here I had a very dark library, low ceiling; long exposure (about 2 seconds); snow on ground helped general light in room, but difficult to handle on the leaded door; local reduction necessary on negative.

"Oh! so interested," Figure 7. This portrait was truly a lucky snap, as the small boy was all animation and excitement during the "Bear Story" being told by his mother. It took six plates to secure just this pose. Taken in dining room, light paper and woodwork; two windows in back of subject to the south. Vista window in picture faced east. No reflector possible with so active a boy. Taken at 4 o'clock in afternoon, during thunder shower, but I just had to have that picture. The bulb was held for one long, intense second.



STRINGLESS BEANS. NATHAN R. GRAVES.



Figure 7.
"OH, SO INTERESTED."
Illustrating Article "Home Portraiture—Simple Window Lighting," by Alice Lillian Becht.



PORTRAIT. Katharine Jamieson.

A COMPREHENSIVE MINIATURE CAMERA

By CHESTER B. DURYEA

IN an article by me on "The Size of the Camera," appearing in the ANNUAL of 1908, quarter-plate dimensions were suggested as being the universal limit of desirability for direct negatives. This idea was based mainly upon two general considerations. One relating to what seemed to be the limit of acceptability of miniature prints; the other connected with the fact that in my opinion cameras smaller than quarter-plate then existing were not sufficiently effective. Besides, the well known optical advantage associated with reduction in size, set forth in my paper referred to, appeared to be adequately exploited in available quarter-plate systems.

Of late, however, I have noticed that many of my typical quarter-plate hand camera results are obtrusively faulty in values, through unavoidable shadow under-exposure. This condition develops even when operating with brightest illumination, and plates as fast as double-coated Cramer Crown. In conjunction therewith a lens of 5½ inch focus, with the associated ordinary quarter-plate hand camera maximum aperture of F/6.3, has been used (depth of field limitation). The exposure, effected by means of a high efficiency between lens shutter, has been about 1/16 second.

Even if it were assumed that the under-exposed effects referred to are not inherent in the conditions, and that the available light action may be just sufficient, false values due to lack of correct rendition of color values would still remain. In order to avoid these latter, which are daily becoming more unpopular, the use of corrected plates (which certainly are no faster than Cramer Crown), is, of course, required, and exposures must be made behind selective filters or light screens, which reduce the average acting light intensity at least one-half.

Thus it is readily seen that without further sacrifice of

depth of field, means must be found to enable the discriminating hand-camerist to be in position to secure from two to four times as much light effect as before. But as the length of exposure cannot be habitually increased, and as the speed of color corrected plates and films is limited, the only recourse appears to be in a further harmonious reduction in camera size, accompanied with an increase in lens apertures.

Perhaps at this point I should remark that it is a matter of favorite practice with me to expose more or less against the direction of principal illumination, so as to secure an appearance of roundness or relief; many others, however, no doubt do likewise.

There are numerous miniature cameras upon the market at the present time, some yet in the experimental stage. While satisfactory selections for limited usage may be made from among these, in my opinion none of the existing designs or constructions do justice to the available advantages associated with miniature plate dimensions, or provide for the great technical perfection of negatives especially necessary in such small direct work, if first rate enlargements, or lantern slides, are required.

In the design of a substantial miniature camera, which should continue to satisfy, the size of picture chosen ought to be just so small that the corresponding equivalent focal length of the lens shall contribute specific depth of field great enough to permit the use of relative apertures which will provide for the full light effects indicated as requisite. Naturally enough depth of field for hand camera purposes must be retained.

Everything having been considered, the camera I am arranging to have built will furnish negatives 1⅝ x 2½ inches, exposures to be made through a lens of about 3¼ inch focus capable of being worked at F/3.1.

The camera itself is to be of the ever-ready box type, and will be fitted with a built-in focal plane shutter. Bellows are not necessary, for with a lens of such short focus a focusing mount will supply all the adjustment needed. Septums will be suitably placed within the camera to screen off entering light not essential to the picture image, and the whole interior is to be lined with black velvet so as to absorb as much diffused and reflected light as possible. In order to further avoid dif-



IN THE PARK. GEO. S. SEYMOUR.

fused light and flare effects in the negatives, a recessed front with appropriate opening will receive the lens, which is to be attached to a removable lens board. Ample rising and crossing movements are to be provided for by a construction of the camera front similar to that so efficient in the well known Newman and Guardia "Universal" instruments.

The design should provide for frequent checking of the focal plane in relation to the focusing scale markings. A ground glass screen is, therefore, necessary, and plates and film-packs will be used. This feature also permits Autochrome and other similar work to be done, in which the high speed of the lens will be of great advantage. Two tripod sockets, accurate T levels, and a carrying strap complete the design, except for the view finder. This latter I am still considering, in an effort to arrange for automatic compensation between the finder and rising fronts.

Finally, when all has been accomplished, I feel reasonably sure that many will agree that the ever-ready diminutive result, compact and light as need be, will have unrivalled capacity for producing really first class negatives under an exceedingly wide range of conditions. The sturdy construction, moreover, will withstand the wear and tear of usage in unexampled fashion.



WATCHING THE FISH. BELLE JOHNSON.



INDIAN SUMMER. Rudolf Eickemeyer.



THE MAN BEHIND

By H. M. LONG

"IT'S all in the lens," is the burden of the catalogues and the magazine advertisements of the makers. They apply this statement to the anastigmats invariably.

I must differ with the makers. I believe it is all in the man behind. Given the necessary technical knowledge, the photographer cares little what kind of a lens he has, unless it be for some specific purpose.

If speed work is the object, the anastigmat is supreme; it is necessary for at home portraiture of children.

If it is landscape that is the aim, anything but an anastigmat is desirable.

When I say it is the man behind, I am not making any pretensions of expertness in photography, but am stating what must be apparent to every one who has used a camera, be he beginner or advanced worker. The beginner has seen the difference in the negatives he made with his machine, and those of an older worker made with the same outfit.

All this leads up to my favorite lens for the majority of the work I do. It is a single achromatic—the same kind of a lens that is placed in the cheapest cameras, with only this difference: it is of fourteen inches focus and constructed for an 8 x 10 plate. The lens has a diameter of one and three-quarters inches.

Some time ago I wanted a long focus lens for my 5 x 7 camera. I did not want a doublet, but found the price asked for single combination anastigmats of that size much more than I wanted to pay. I already had a Tessar working at F/4.5 and thought that enough of an investment for a high grade outfit.

I studied the catalogue of every lens manufacturer. Finally I decided an achromatic was about what I wanted and I ordered one. I paid the maker $4.50 for it at the factory, and

to that was added $1.50 express on my shutter both ways so the lens could be fitted. My 8 x 10 lens cost just $6.

I intended to use the lens only for landscape work. With an effective aperture of F/16 I could see little use in it for anything else and mounted in a Compound shutter it did satisfactory duty in the field.

I had been using the Tessar for portraits, but was not satisfied with the negatives; they were too sharp to suit. Various printing dodges were resorted to and still I was dissatisfied.

I decided to use the achromatic on an adult. My light was good and by using reflectors I found I could get results with exposures of from six to eight seconds. Sometimes in other positions and different lighting I ran to ten and twelve seconds.

Then I began to figure on the greater diffusion in the negative itself. I took the diaphragm disc to a metalworker and had it cut out until only a rim was left for a ray screen. Then I could get as soft negatives as I wished or as critically sharp.

In the meantime I added a Smith lens to my outfit. It does satisfactory work, but I had used the achromatic so long it came in for almost everything, and it does the work.

I have gone the gamut of lenses. I started like many others with an achromatic in a little box camera, then came rectilinear, anastigmat and finally I was back where I started—achromatic.

I hold no brief for the maker of the cheap lens. If I did I would not have in my outfit a lens with effective aperture of F/4.5. Neither would I have my mirror camera fitted with focal plane shutter and other materials that run into money. With me it is a question of the apparatus that will give the effect desired.

I have done considerable portraiture. I never use my anastigmat unless the sitter is a child who cannot be kept still. I did use the single lens once on a mother and child and gave three seconds, not daring to risk more on a babe of a year. I did not expect much but did get a negative good enough to print from and it has all the softness one could ask. But I should hesitate before trying it again.

With the achromatic it is possible to get as soft negatives as may be wished. One may get as much diffusion as is possible with almost any other lens, but like some of these other single



JEANNE.
(Made with Achromatic Lens)

Illustrating Article "The Man Behind," by H. M. Long.

lenses that are so popular now the user must be on guard against halation.

We call it halation, but I believe halation is not the right term. It is more a spreading or running around of the image wherever there is a high light. It is visible on the ground glass and I have not found any of the anti-halation treatments worth anything in this case. You may overcome halation around windows in development but it does not work with this running around of the image.

This is caused by not properly placing the sitter with regard to the light, by reflectors not being in correct position and more largely by using the lens at too large an aperture. When this spreading of the image is noticed often a slight stopping down is sufficient to eliminate it and at the same time not be enough to make the image too sharp.

I shall keep my battery of lenses; perhaps I shall add to it. But I am sure I never shall purchase a lens that will give me the solid comfort and satisfaction and produce negatives that will make me turn from my old achromatic. It's the cheapest I own and optically considered the worst, but it is my dearest photographic possession.



SOLITAIRE. WILLIAM S. RICE.



AUTUMN MIST.
(Made with Achromatic Lens)
Illustrating Article "The Man Behind," by H. M. Long.



COPPER RIVER, ALASKA. FELIX J. KOCH.

HUNTING BY CAMERA ALASKA-WARD

By FELIX J. KOCH

WE had had our pre-conceptions, obviously! Away back in our district-school days, we rather remembered Alaska was a symbol for glaciers, pine forest, Eskimo and seal; for *totems* and icebergs and gold mines. Wherefore, once we'd become addicted to the camera-habit, a perfect slave to it in fact, and had rambled from pasture to pasture, sipping the nectar of the quaint, the odd, the beautiful, among subjects, we felt the lure of the North, and *trekked* it to Alaska.

Of course ours was a kodak. Hold up your hands not in awe, reader, for you will find that away from beaten paths, only films will do for photography. Imagine climbing Mt. Olga, behind Seward, "mushing it," as they say, over stock and stone in rarest atmosphere, until your heart palpitates



THE ARTIST. ELIAS GOLDENSKY.

past the line of danger, and then suddenly stumbling on a protruding root, and dashing to pieces three boxes of plates! Not only that, but think of the weight of three dozen, and how will you load in day-light, on the mountains?

But to Alaska:—We began the jaunt at Cordova. Cordova will some day be the center for one of the greatest trans-shipping businesses in the world. It is at present the terminus, or 'start,' as you will, of a baby railway—the route so short you can cover it in two hours, which will lead, eventually, across the Alaskan Peninsula and connect with steamers that will take export and import off the Trans-Siberian across Asia to Europe.

To-day, though, the train on the Copper River railway was an ideal one for picture taking. In fact, it was a picture in itself. Two flat cars with benches to right and left. You could turn on your heel like a pivot and take anything in sight. At the rear were two closed coaches for the return trip, when, pictures taken, you were entitled to rest.

A lake of sea, for all the world like Lucerne the beautiful, is here, hemmed in by stately mountains, forest-clad, and that too made a picture. Above, the clouds lowered and rose! you could take pictures of "Swiss Alps," of course, and make friends believe, later on, you'd spent your summer abroad. Landscape photography is interesting ever, to both novice and camera-slave.

Nor was the speed of the baby railway too rapid for pictures. We could cover fifty-five miles inside of two hours. Every passenger was a tourist—a common tourist, they say in California—and so the train stopped whenever you asked them to halt, while you got a "snapshot." Spendid advertisements for future traffic, of course, that was, for when you got home you showed your own pictures, went into raptures about Alaska's beauty, and this as you never would do with the most attractive of railway folders, of course. There is method sometimes in madness, up there near the top of the world.

But—when we came into those mountains our thirst began to satiate, our picture thirst, that is. Forests of dead trees, first of all, permitted of unique studies. Queer scarred masts, erect and tall, with some wild bird perching unafraid upon the limbs, and then, in background, snow-capped mountains—



THE DEAD BIRD. JOHN T. ROBERTS.

they put the Rockies of Canada, even, into shade for their picture powers.

Wherever scenery is fine, of course, photography must flourish. There was a halt on a switch and folk got out and picked salmon-berries. That, too was a negative worth while; the pretty young girl from the West—the effete land—eating the berries of the Indian. But, don't go to Alaska for pictures of Indian or Eskimo, not scenic Alaska, that is. Away to the north, on the Behring Sea journey, for which one takes ship at Seattle, that stays out of sight of the coast till away past the islands at the tip of the cape, there you will find them. But in scenic Alaska, southward and inland of Seward, there is not an Eskimo known.

Indian studies! At Metlekatla you meet Indians, but you would not know them from an American negro, for they are part and parcel of a mission settlement, and dress as any poor man would.

So there are other disillusions with Alaska, the Alaska one actually visits. One such is the totems. Pick up the steamship folders and you'll imagine you'll come home with a collection of totem snapshots enough to fill a magazine well nigh. But at Wrangell a few miserable carved poles, their colors washed out and faded, are really the best and almost the only ones you will get.

Hence, you who want truth in your pictures of Alaska—want the really typical—must level at other things. Nor is there dearth then of points of interest—camera interest. Two glaciers come creeping down from the mountains to left. One, the Sheridan, is a dead ice pack. It is green to white, with brown morraine. And here, for once, camera lover though we are, let us "take it out" on photography for having misled, no doubt, tens of thousands. If you have never seen a glacier, you recall the beautiful pictures of them, of the Muir, the Mer de Glace, the Grindel-wald and so on —the mountain of ice, white as the snow-flake, coming gently down between two taller peaks.

Then, when you come to your first glacier, you look, astonished. A glacier is not white, but blue—the richest, deepest, most beautiful indigo you can imagine. Where it lies exposed a bit to the sun, it fades a little, then more and more; and at

edge is the colorlessness or water, perhaps white. To explain the phenomena, be it stated that that mighty ice-pack extends a front sometimes ten miles in length—as its cow-catcher, so to speak. On this the sun shimmers, melts a bit here, a bit there, and gravity sets to work on that which lies about, till, of a sudden, with a giant roar, a mighty fragment, that would do an ice-dealer's heart good to see, tumbles into the stream always flowing from a glacier front. Where the tear came from the whole, you see that compressed ice, indigo as stated. So



THE GLACIER. FELIX J. KOCH.

it remains, an hour, two, three. Bit by bit though, it is fading. The ice at top is slowly melting, and the melted portion, flowing on, creates a transparent film, but one to make the part beneath seem paler blue. Under that, again, it is the gorgeous shade, but of course, it is hidden. Then the sun pours down. It is hot, that sun. We shed our coats and vests as we climb in search of pictures, and, by and by, the top of the "sore" is white. But the white, the azure, the indigo, all "take" white, in a picture, and so the camera shows but the solid facade of white.

Endless wonders does the glacier offer the photographer.

At its front, too, in among the boulders, ground round and smooth by the oncoming ice, you will find a million wild flowers blooming. They are beautiful, these alpine posies. They, of themselves could give a summer's study for the album of the camera enthusiast.

And then there are the Alaskans, types of a frontier life that is growing rarer, ever rarer, and which no real photographer at heart can fail to want to perpetuate. The little log cabins, the pet bear outside, the men in the rude garments fitted to the roughness of mountains, the women in cheap calicos, in their kitchen gardens; the children, brawny and tanned, barefoot in the summer—they make up a medley on which the photographer feasts.

It is a mine wholly exhaustless, this Alaska—for the camera. One might wander on and on and on, at its heart, and when one has taken all the negatives he has with him, then—well, then he believes the field but merely scratched. And next season he is back for more pictures. And so the next and the next.



OUT OF GLOUCESTER. JAMES THOMSON.



IN OBERAMMERGAU. P. F. STODDARD.



THE EDGE OF THE POND. K. T. KRANTZ.

PHOTOGRAPHING SNOW SCENES

By K. T. KRANTZ

ALTHOUGH the photographing of winter scenes is frequently accompanied by some physical discomfort in the way of numbed fingers and chilled toes, the bodily woes are soon forgotten, while the photographic results remain a joy forever.

The reason for the especial charm of winter scenes, particularly snow pictures, is probably due to the fact that the pictures may be rendered almost exactly true to nature in color values as well as gradations, when printed on the so-called black and white papers, such as gaslight, bromide, platinum or black carbon.



A WET DAY IN DUBLIN. MRS. D. MAHONY.

Properly speaking, black and white and all the intermediate grays are not colors, but the word is used in this case to differentiate between the rendering of colors by relative shades of tone, which is necessary in landscape photography during the other seasons.

One great difficulty to be overcome in much of this work is the proper rendering of the extreme contrasts which are frequently encountered. For instance, a scene is discovered



THE SLEET STORM. K. T. KRANTZ.

which contains dark tree trunks, possibly in the shadow, brilliantly sunlit snow and shadows cast by and on the snow. Ordinarily, if sufficient exposure is given to secure the gradations in the shadows, the snow is so badly overexposed that the delicate shades in the same are completely blocked out. Conversely, if a short exposure is given for the snow the dark objects appear as meaningless patches of black in the print.

However, this difficulty may be overcome by the use of the proper ray filters of varying depths, the reason being that the snow reflects a large amount of blue and ultra-violet light,



SUMMER AFTERNOON. **Theodore Eitel.**

to which the photographic plate or film, even though rendered orthochromatic, is supersensitive, and the high lights, which would probably be too strongly impressed anyhow, are greatly increased in value; and the ray filter, by changing the reflected blue lights to green and retarding the white tones, enables the shadows to be properly impressed on the plate without losing the values in the high lights.

As a general rule it will be found that a filter requiring about eight times normal exposure will give satisfactory results, while in some cases, such as photographing against the light with very dark objects in the foreground, a filter which multiplies the exposure by fifteen will be necessary.

In this connection a caution may be required.

The normal exposure for snow scenes given by exposure meters or tables is from one-quarter to one-eighth that for a normal landscape with the same light. Not the former, but the latter, is the figure to be multiplied by the excess time required by using the ray filter.

To obtain the best results a non-halation, orthochromatic plate or film should be used.



IN THE GRIP OF THE ICE KING. WILLIAM S. DAVIS.

PLATINUM—THE PICTORIAL PHOTOGRAPHER'S PROCESS

By E. G. BOON

IN attempting to render sunshine I have found no printing process so responsive as platinum. Carbon with a judicious choice of pigment and a carefully selected support will give a great deal of the warmth of sunshine, and bromoil can be controlled so as to give an excellent suggestion; but for the rendering of shadow transparency (so necessary in sunshine pictures) and of the delicate half tones to which so much of the charm of these pictures is due, I find platinum by far the best method.

It seems strange that this beautiful process should be neglected by pictorial photographers. There seems to be an impression that a peculiar negative is required—a so-called plucky negative. And that thin negatives give poor prints in platinum. This is quite a mistaken idea, as with careful printing all kinds of negatives can be successfully used. Another advantage is that the home manufacture of small quantities of sensitized platinum paper is an easy matter. This gives a choice of paper and surface that often proves of inestimable value.

A platinum picture has a character of its own. No one can mistake it for anything but a photographic picture. A properly rendered platinum picture sums up the whole case for photography to be regarded as an art. By no other process can the delicate merging half-tones, the fine values, the transparency of shadows with shadow detail, the charming softness of pigmentary deposit, be so well rendered.

As I have written before, if photography is to secure for itself a place as an art, it must do so by proving itself distinctive. It will never secure recognition by clever hybrid methods. These methods may prove the workers to be clever artistic conceivers and deft manipulators and the results in



SMILE. J. WILL PALMER.

many cases afford aesthetic pleasure, but these methods, interesting as they are, retard the progress of true pictorial photography.

The platinum picture which has been properly controlled from its inception to the finished print represents, I believe, the most distinctive character of, and has a beauty peculiarly belonging to the photographic art.



ON THE ST. LAWRENCE RIVER. HARRY GORDON WILSON.



PORTRAIT. Ryland W. Phillips.



SOME CONVENIENCES IN PHOTOGRAPHY

By JOHN BOYD

THE ardent photographer is ever planning little short cuts to success, and constantly adding to the conveniences that make his work easier and more pleasant.

It is a natural fact that what will suit one worker will not another, but nevertheless the exchange of ideas will help in finding something that we may adapt to our own ways of working. Some of the things that are of proven value is what we all are after, and if one or more of the following will assist the photographic plodder he is more than welcome to them.

Take the tripod-top as a starter. How many of these are equipped with a screw that cannot become detached? If you have one that is forever getting lost, or in danger of being so, take a file and reduce the diameter of the screw 1/16, or even 1/32 part of an inch near the shank. Then fashion a notch-shaped piece of brass or tin a little larger than the diameter of the reduced screw, but not sufficient to allow the threaded part of the screw to pass through. Fasten this with two small screws to the under side of the tripod head, and you have forever banished the care you have hitherto lavished on that part of your outfit.

Another vexatious item of your outfit is the focusing-cloth. How to best hold it in position while you are at work so that it will not in any way hamper you and, at the same time, leave your hands free for other operations.

My way is to attach two pieces of wide garter elastic to each side at such places as will necessitate slight stretching to bring them together when placed around your camera. Having determined this to your satisfaction, sew a hook on one piece of elastic and an eye on another. Buy these large and strong and they will hold under any and all circumstances, and the few minutes' work involved in completing the whole job will be the best investment in time that you have ever spent.

Is your stock of negatives getting large, and can you find any one of them at a moment's notice? I have thousands of several sizes, both on glass and films, and if you ask me for any one made during the past twenty-five years I will guarantee to hand it to you in less than a minute; in fact, ten or fifteen seconds is more like the average time.

It took me some time to get them into this shape and it was only after trying several plans and discarding them as failures that I devised the present one, which, to my mind, as well as all those who have seen it, is without a fault.

In the first place, most of my plates are 5 x 8 and 5 x 7, though there are several hundred 3¼ x 4¼, 4 x 5, 8 x 10 and 4¼ x 6½ on both glass and films.

Each size has a series of numbers alloted to it, and the negatives, as soon as dry, are numbered in ink, which, with the date, year and any other particulars, are written on its margin.

These are then indexed in an alphabetical register of loose cards such as a modern office-staff uses in its work. On the left-hand side of the card is the number of the negative; then follows the title, etc., and on the right-hand side is the page and number of the album in which the finished print finds a permanent resting-place. The negative is now ready to be put away in its proper place for ready reference and easy mode of access. For this I have made use of the original plate-boxes. There are usually three of these with every dozen plates. I throw away the inside or smaller one and cut out one of the ends of each of the other two. These are placed within each other and a strong piece of Manila paper pasted over the ends that still remain, letting this run over an inch or more on the bottom of the inner box to form a hinge. This gives us two boxes in one, and hinged at one end.

Supposing we are filing away 5 x 7 negatives. I have the printing-office or paper-dealer cut a lot of paper 4¾ x 7¼, one of which is to be placed between each negative. There are twelve to a box and all are consecutively numbered, the numbers being placed on the quarter of an inch which extends out from the negative. These boxes have numbers plainly printed on the outside indicating what they contain, and are set away on edge on shelves in a cupboard.

In practice, supposing you ask for the negative or a print



THE QUEEN IN EDINBURGH. WILLIAM CROOKE.

of a clump of anemones or wind flowers. That will be registered under both "A" and "W." Turning to either of these cards in the index-box, we find the negative is numbered 1070; the print in album 8, page 14. We open the cupboard, run our eye along the boxes until we come to the box containing negatives 1061 to 1072. Pulling it out, we lift our plate from its place, and there it is! To see the print is merely to open the bookcases; take out album 8, open at page 14, and our desires are satisfied.

The explanation may seem to indicate a complicated system, involving a lot of work, but it is the opposite, being very simple and capable of giving the greatest satisfaction with a minimum of labor.

While I am on the subject of filing I may as well explain how I took care of the hundreds of prints that are kept for publishers' use and which have to be available, often on short notice.

Nearly every amateur has more or less of these and one is sure to find them stuck away in books, in drawers, in boxes and, I am sorry to say, other places that have passed out of the recollection of their owners.

To wait until one of these unsystematic persons finds some wished-for print is a trying experience and full of moral-making resolutions. But I am not going to preach on that subject now, but tell how I manage to keep my stock in order.

I again make use of a filing-cabinet with stout index-cards. These were purchased in blank and on the tabs I printed the class of subjects that were to be placed in the respective sections. Some of these headings in my collection are: Animals; Birds and Nests; Buildings; Street Scenes; Clouds; Flowers; Fruits; Fishing; Groups; Genre; Portraits; Hunting and Camping; Insects; Fungus; Landscapes; Marines; Winter; Farming, etc., etc.

I have found placing them under such headings an easier way than filing them according to negative numbers; at any rate it is for me, but others may find favor with the numbered system, and it is for them to choose which will please them most. The utility with the "subject" plan is that it keeps all classes by themselves and enables one to look over or show an interested person whatever you have in his particular field



THE KING IN EDINBURGH. WILLIAM CROOKE.

without the necessity of going over your entire list of negatives and picking out here and there what may be needed. It is here a case of adapting a system to one's individual requirements.

In making enlargements from a dense negative, or when the light is dim, it is difficult to get it finely focused on the screen. But it can be accomplished to a nicety by taking a piece of glass well cleaned, and, with a fine pen and India ink, ruling cross-lines ⅛ of an inch apart and using it to focus by in place of the negative.

The handiest way to obtain the best results is to use the negative to obtain a general idea of the size and shape of your enlargement. Then take it out of the holder, insert the lined glass, which will be projected on the screen plain and distinct. Get the proper focus, then replace it with the negative you are going to work with and you will have as fine detail as it is possible to get. Be sure to put the ruled side facing the same way as the film side of the negative, viz., toward the enlarging-screen.

There are times when one wants a print off a negative as soon as it is out of the fixing-bath. This is safely accomplished by placing a cleared-off film between the negative and the bromide or development paper. This keeps the paper away from the hypo-saturated negative and allows the exposure to be made without wetting the paper.



CLIMBING ENGINEER MOUNTAIN,
NEAR OURAY, COLORADO.

GEORGE L. BEAM.



AMONG THE ARABS. H. M. LOMAS, F.R.G.S.

AMONG THE FOLLOWERS OF THE PROPHET

By H. M. LOMAS, F. R. G. S.

THE followers of the Prophet are, to put it mildly, somewhat adverse to having their photographs taken. When the Turkish Government issued coins, on which the head of the Sultan appeared, such was the feeling against them, owing to the representation of the human face upon them, that the mintage was withdrawn.

There are two reasons for their dislike of the camera: the first is a religious one, for Mohammed, in his hatred of idolatry, forbade the making of any counterfeit of man, so the making of a portrait, in the eyes of many of the faithful, is a thing forbidden. The second is a superstitious one, and rests on the belief that through damage done to the image or portrait of a person, harm may come to the original himself.



A WIND STORM IN THE MOUNTAINS. F. L. Douglas.

To prowl with photographic success in a Mohammedan country, the foregoing facts must be borne in mind, and then the difficulty can be overcome; for if, on the one hand the traveler treats the belief of the people with respect, and shows himself wishful not to hurt their feelings, and on the other he shows that he is their friend and wishes to do them no ill, their reason for objecting to the picture-maker has been removed.

The key-note of successful work with the hand camera among people of other nations is to treat them with courtesy. If this be done, one can go with safety among "dangerous" people. It is the same the world over. In Chinese slums or among the head-hunters of Borneo, if one does not vex or raise the suspicions of the people, photographic pictures of great interest can be secured.

Once when working in North Borneo I had a case which points its moral. I was prowling in a village of Dusun people when my companion, a British officer, pointed out a certain house where a woman lay dangerously ill and warned me of it. Had I been seen prowling around and pointing my "picture-box" at it—I was using a bioscope camera—and had the woman subsequently died, the conclusion which those people (ardent believers in omens and charms), would have come to, would have been that I had cast a spell upon her, and there would have been trouble. Some of us may laugh at their ideas, but still the fact remains that as they considered a white man had been the cause of death among them, they were, from their point of view, quite justified in removing the danger. In other words, in rising against the white men.

The Chinese, even up-country, are just the same; I have had crowds of merry kiddies clambering around me and up the legs of my camera when working alone away up the West River, some two hundred miles up from Hong Kong. Then is one's chance of getting pictures, for when the children trust you their elders will look on you with a kindly eye. The Chinaman loves a peep-show, and the view-finder is an undoing delight, can you but get him to look into it. Having approached the white devil's machine and found it to be a beloved peep-show, he ceases to look upon the camera as a thing of terror. You have gained a free pass, and can do what you please.

Speaking of peep-shows, the most delightful one I have ever seen was in Singapore and run by a Chinaman. When the delighted gazers gave way, I took my turn at the peep-hole—it was a stereoscope, with two different pictures in it, one for each eye, at the same time! The effect was truly unique.

Strange things certainly do happen in the Far East, and the following anecdote, for the truth of which I can vouch, is puzzling. Some years ago, in a newly opened country, the chief engineer, who was a keen and careful photographer, noticed a very fine Devil tree in the jungle. Having his camera with him he took a photograph of it, although his coolies told him that "the White man could not make a picture of it, for the tree was full of devils."

On developing the plate, nothing appeared—which was disappointing, for the tree was some distance from his place and he might not get the chance of going to it again. However, somewhile after, he was able to spare time and re-visited the tree and secured the desired photograph. What was his surprise when on developing that plate, once more nothing appeared! What his coolies had said had come true, and when he told me the tale, somewhile after, he had got no photo of the tree and it was very unlikely that he would ever get the chance of visiting the spot again.

Morocco and Algeria, Moors and Arabs give fine work for the camera; but one has to be most careful to respect their feelings, they are fine and strong-willed people who will stand no nonsense. Make them your friends and all will go well; and if, as was once the case when my wife and I were prowling in one of the little-known towns of Morocco, you see signs of coming trouble among the "roughs"—for there are malcontents in every land—do not run away—be quiet; do not move away, but let them see that, although you respect their feelings, you are not afraid. To be scared and to show it, makes the innocent suspicious and the "roughs" bold.

Turkey and beautiful Constantinople are a delight to the camera man, but need careful handling—at least their people do—and here it may be noted that all Mohammedans are jealous with regard to their women folk. Treat the people of



THAMES BARGES. A. R. F. EVERSHED.

Constantinople and their feelings with respect, and they will assist and not hinder you in your work, but should a tactless person attempt to cross them, there might await him a Turkish prison from whence he might be removed in an ignominious manner by his Nation's representative. Soldiers, police, priests, and people, all will help you, if you show yourself their friend; and they are a courteous people.

You may say that my motto has been repeated ad nauseam—for which forgive me, yet I repeat it in another form—"One touch of Nature makes the whole world kin."



SELLER OF GRAPES, CONSTANTINOPLE. H. M. LOMAS.



A STRETCH OF HILL AND VALLEY. E. L. CRANDALL.

PAPER NEGATIVES DIRECT IN THE CAMERA

By PAUL L. ANDERSON

THE manufacturers of dry plates, and the editors of photographic magazines, have told us so long and so emphatically of the superiority of orthochromatic plates and ray-filters over any other light-sensitive equipment that many of us have forgotten, for practical purposes, that there are some conditions and circumstances in which the ordinary, *i. e.*, blue-sensitive, emulsion is preferable to the orthochromatic.

Let it not be thought that the writer is advocating the abandonment of orthochromatic plates; far from it, for such equipment will be used by a good technician five hundred times for every once that the color-blind emulsion is desired, and almost all of the writer's work, especially portraiture, is done on double-coated, orthochromatic plates, using a ray-filter, but it is not felt that any man can be considered to possess a first-rate technique unless he is prepared to take advantage of the good points of every available piece of apparatus.

It may be of interest to consider, first, the relative advantages and disadvantages of the color-sensitive and non-color-sensitive emulsions, and it may be admitted that for portraiture the advantage lies, in every case, with the former, since it renders the color-values, and hence the planes of distance, with greater correctness, thus giving a greater degree of verisimilitude; but this advantage is in great measure lost unless an adjusted ray-filter be employed.

Some workers may object that this involves excessively long exposures, but a discussion of this question is outside the scope of the present article, and it may simply be said that the writer uses a fast ortho plate, a five-times filter, and a lens working at F/7.5 for home-portrait work, only in extreme cases discarding the filter, though, of course, a soft-working developer is imperative. For landscape work the color-corrected combination is necessary when it is desired to render



THE ARTIST. E. G. DUNNING.

the planes of distance as they appear to the eye, to secure an accurate relationship of color-values or to get both landscape and sky on one negative, and it might seem that this collection of desiderata would be all-embracing.

One defect of this practice is the fact that each leaf, each blade of grass, each twig is rendered with absolute fidelity, thus necessitating, if pleasing softness of definition is to be secured, the use of an uncorrected lens, printing from the back of the negative, or some other method of subduing detail. On the other hand, a blue-sensitive emulsion, being unaffected by any rays except blue (that is, the blue component of white light) or the (invisible) ultra-violet, has the effect of emphasizing any moisture in the air (since this reflects chiefly blue rays) thus heightening the values of distant objects and making the distant planes seem further from the spectator than was visually true in the original landscape.

As a corollary to this may be mentioned the fact that on a clear or nearly clear day all the shadows of a landscape (and this includes the minor shadows, such as those on the under sides of the leaves) will have an over-lying tinge of blue superimposed on their local color, by reason of sky reflection. Hence a blue-sensitive plate will render such shadows more nearly of the same value as the illuminated portion of the object casting the shadow than will the orthochromatic plate, thus tending to mass the insistent detail of the scene.

Incidentally it will be seen from the above that the ordinary plate is practically useless for snow scenes, since the shadows will be rendered too light in relation to the illuminated portions of the snow. True, this may be corrected by brief exposure and forced development, but trees and other objects are then rendered as excessively dark.

For snow scenes, including trees, houses, etc., the orthochromatic, double-coated plates and the ray-filter are required if the gradations are to be rendered in their proper values.

Suppose, now, that we wish to photograph a landscape, taking advantage of every particle of atmosphere perspective, so as to make our planes retreat and to mass the foliage, and that we are willing to print our sky in from another negative or to suggest a clear blue sky by simple shading, or that we do not wish to include any sky, then it is obvious that we will



THE VALLEY. Harold Cazneaux.

use a blue-sensitive emulsion rather than an orthochromatic or a panchromatic one, though the color-sensitive emulsion, used without a ray-filter, shows little difference from the non-orthochromatic.

Then arises the question of whether this emulsion should be coated on glass or on paper; that is, whether we should load our plate-holder with glass plates or with bromide paper, and the writer prefers the latter for the following reasons:

(1) It is cheaper.

(2) It is lighter (to handle after exposure).

(3) It is unbreakable.

(4) Modifications in relative values are more easily carried out, with pencil or with stump, than on plates.

(5) It is less bulky to store.

(6) The grain of the paper has a tendency to aid in the massing of detail.

(7) It is non-halation.

On account of the last-named quality the writer has succeeded in retaining printing quality in a clear sky with light, fleecy clouds, by giving barely enough exposure for the landscape and developing very cautiously in a dilute rodinal solution, though it should be noted that in this case the landscape was of the type termed "open, without strong objects in the foreground," and given a subject-factor of ½ in Burroughs, Wellcome & Co.'s exposure table.

As against these advantages must be set the undoubted disadvantage of slowness, thus generally precluding its use for moving objects and for portraits.

Having observed the various advantages and disadvantages of bromide paper for direct negative work, as compared with the ordinary dry plate and the orthochromatic plate, let us take up the method of handling, which differs slightly from that employed with plates.

Choice of Paper.—Obviously, there are three points to be considered in selecting a paper: (1) Speed of emulsion; (2) speed in printing; (3) durability. The first factor will be considered under "Exposure," and it may be said that (2) and (3) are inversely proportional. That is, the tougher papers are generally slower in printing and the choice must be a compromise between ease of handling and rapidity of

printing. The writer's experience has been entirely with Wellington & Ward's Platino-Matt rough, which has been found very satisfactory, though for use in making enlarged negatives Eastman's Standard, grade A, works well.

Loading the Holders.—Since paper is flexible, some means must be used to make it lie flat in the plate-holder, and the best way is to lay over it a sheet of clean glass the same size. That is, take a negative from which the film has been removed, put the paper into the holder and load the sheet of glass into the holder just as though it were a plate.

Focusing.—Since the sensitive film is distant from the usual plane of the film by the thickness of the glass which holds it in position, allowance must be made for this in focusing, which may readily be done by racking the lens about a sixteenth of an inch nearer the ground glass after the image has been satisfactorily focused.

Exposure.—All bromide papers are much slower than fast plates and the different makes vary greatly in speed. Wellington & Ward's Platino-Matt has a speed factor of 4 on the Burroughs, Wellcome & Co. exposure scale, which is equivalent to F/20 on the Wynne meter, or 8 on the Watkins, but since this paper is not readily obtainable throughout the United States, it may be well for each worker to determine the speed of the paper he intends to use.

This may easily be done by a brief series of comparative tests in the dark-room, using Eastman's Royal bromide for a standard, and testing for the relative exposures required to print the high lights of any negative. The speed of Royal bromide is 2½ B., W. & Co., F/25½ Wynne or 13½ Watkins. That is, Royal bromide will require twenty times the exposure of a Seed's 27 plate.

This being known, and the relative exposure times of Royal and the paper to be used being found, it will be easy for the worker to determine the correct exposure for any set of conditions, no matter what form of exposure table or actinometer he is accustomed to use.

Development.—In general the instructions for developing the particular paper used are given by the manufacturer, but the developer used should always be diluted to about one-



DRYING NETS. CHAS. E. WANLESS.

fourth the strength recommended in the direction sheet and potassium bromide should not be used.

The reason for dilution and for the omission of bromide is that this course tends to diminish contrast, and it is well known that slow emulsions tend to give more contrast than fast ones. Any good negative developer may be used, but the writer generally employs amidol (dianol), since this, working as it does without an alkali, is less likely to cause blisters under trying conditions of water or temperature. Exactly as in the case of a dry plate, development may be forced for greater contrast, or abbreviated for softer results.

For a given degree of printing contrast the apparent contrast by transmitted light should be rather less than in the case of a dry plate, and by reflected light somewhat greater than in the case of a bromide print. For a full-scale platinum print the shadows should be nearly but not quite clear, and the high lights should appear blocked up when viewed by reflected light but translucent when viewed by transmitted light.

Fixing and Washing.—Fixing and washing should be carried out as directed in the instruction sheet, but it may be noted that if the emulsion shows a tendency to blister this can be prevented by ten or fifteen minutes' immersion in the following:

Water	10 ounces
Formaldehyde	1 ounce

This should take place after fixing and before washing. A 10 per cent solution of chrome alum will do equally well.

After-treatment.—Negatives on bromide paper are as amenable to local or general intensification or reduction by chemical means as those on glass, and if the modifications are to be carried out by means of pencil or stump the paper negative is to be preferred, since the changes may be effected directly on either surface of the paper, without the use of retouching medium, ground glass substitute or any similar preparation. Furthermore, if local reduction is desired an excellent plan is to use a hard pencil eraser and work on the film, the eraser having a broad or a sharp point according to the effect intended.

Printing.—Printing will be slower, of course, than with a glass negative, but a paper negative will print on platinum in July sunlight in from three to thirty minutes, depending on the



STREET SCENE, CHICAGO.

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quality of print desired. If desired, the negative may be waxed to render it more translucent, but the writer prefers to work for a thin negative and print without waxing.

For those who wish to try the effect of greater translucence a formula is given below. On theoretical grounds it would seem that waxing would reduce printing contrast by decreasing the time of printing, but this cannot be stated authoritatively.

Turpentine	3 ounces
Powdered resin	1 ounce
Gum elemi	1 ounce
Paraffin wax	½ ounce

Heat with stirring until it begins to boil, allow to cool slightly and add

Turpentine	3 ounces

Lay the negative face down on a blotter and paint thinly with the mixture. Give three coats.

Grain.—Paper not being homogeneous, like glass, the grain of the negative support will be visible in the finished print if a smooth printing paper be used, but if a moderately rough platinum be employed, or, in fact, any paper with a slightly rough surface texture, the grain will not show. The necessity of using a rough paper militates against the use of this method for sizes smaller than 5 x 7, and even in that size a smooth bromide paper should be employed for the negative.

To be sure, many workers will find the effect of grain desirable, and such will print on a smooth paper, though even then the texture is often not visible. Some manufacturers supply a "negative paper" especially designed for use in making large negatives, and it is suggested that those interested experiment with this, for the emulsion is coated on a smooth, tough and fine-grained paper which would seem to present advantages when a moderate amount of detail is desired.

In conclusion it may be said that for landscape work, when speed is not imperative, and when it is desired to secure the maximum of atmospheric effect with a massing of fine detail, bromide paper presents distinct advantages over dry plates for the original negative. On the other hand, it cannot be denied that the range of usefulness of this medium is very limited and that in the vast majority of cases the orthochromatic plate is to be preferred.



THE JACK-KNIFE. HELEN W. COOKE.

RETOUCHING THE LANDSCAPE NEGATIVE

By J. C. HEGARTY

IT is not the intention of the writer to give a detailed description of the art of retouching, as that is too large a subject to be comprehensively treated in a short article, but rather to call the attention of the earnest worker to the advantage to be gained by a limited amount of careful work on the landscape negative.

There are few negatives that are perfect or that cannot be improved by judicious use of the pencil or etching tool. Some defects are found in the majority of negatives which, if not corrected, may ruin what would otherwise be a beautiful effect. Among the defects in landscape negatives are too much or too little intensity, high lights or shadows that are too pronounced, blurred trees or figures, lack of clouds due to over-exposure of the sky, loss of detail through hazy spots and halation.

All of these defects may be remedied more or less by careful treatment. A proof should be made from the negative that is to be retouched and carefully studied to determine what should be done to improve the negative so that it may yield a harmonious print. Probably a number of defects will be found, and the aim should be to correct the most pronounced in the first efforts, bearing in mind, however, that it is better to do too little rather than too much. As in all photographic work, great skill is only acquired by considerable practice, so the first efforts should be limited until the hand becomes skillful, when the amateur may attempt more difficult subjects.

The first work on the negative should be the reducing of the parts that are too dense or that print too white, by using the etching knife, rubbing down with alcohol or local reduction with persulphate of ammonia. The first method requires considerable skill and should not be attempted until after some practice on negatives that are not valuable. Much can be



THE MAPLE-SHADED LANE. C. M. Whitney.



done by rubbing the dense portion with a piece of chamois skin moistened with alcohol, but probably the best method is that of local reduction with persulphate. This, if carefully done, is productive of good results. After the dense portions have been reduced it may be necessary to use the pencil and retouch the places to make them even and not spotty, as they might otherwise be. Attention should then be given to the shadows, where it may be advisable to use the pencil to touch up certain parts and add life to a dead expanse of shade.

Trees can be greatly improved by adding a half-tone here or a high light there, care being taken to give the proper touch, as different trees require certain marks to represent their foliage. The trunk and boughs of a tree will require some work, and should the foliage be blurred, caused by the blowing of the wind, both the pencil and etching tool will be required to remedy the defect.

If the view includes water, as a lake, broad river or small stream, there will be use for the knife or pencil. Where the sky is reflected on the water and is too vivid, reducing should be resorted to. The shadows of trees or hills can be broken up by using the pencil, and weeds and grasses may be penciled in on the banks of streams, and wild flowers may be worked in some places on the negative that demands something to balance the effect or enliven an otherwise bare expanse. A close study of nature will teach the worker more than pages of description. After the amateur has had some experience he can attempt the working in of clouds on his negatives. If the sky portion of the negative is very dense it should be reduced with persulphate and the cloud forms put on the negative with the pencil or with the stomp and pencil filings.

In this part of the work practice aided by much study of cloud forms will give the worker the ability to make pleasing skies instead of the white expanse frequently seen in otherwise good prints. The careful worker will study all of nature's effects and have them in mind when retouching or modeling a landscape negative, and after using some care in removing the defects on his negatives will feel amply repaid for the time devoted to the work.

DISCOURAGEMENT THE FIRST STEP TO SUCCESS

By WALTER C. AHRENS

HOW often we find that people who buy their first camera or kodak become discouraged and give up. Perhaps their experience is something like this.

After reading carefully the instructions, received with instrument, they proceed to make exposures, following faithfully the printed directions. They develop the films or plates carefully as directed by circular received with developing solution with gratifying results.

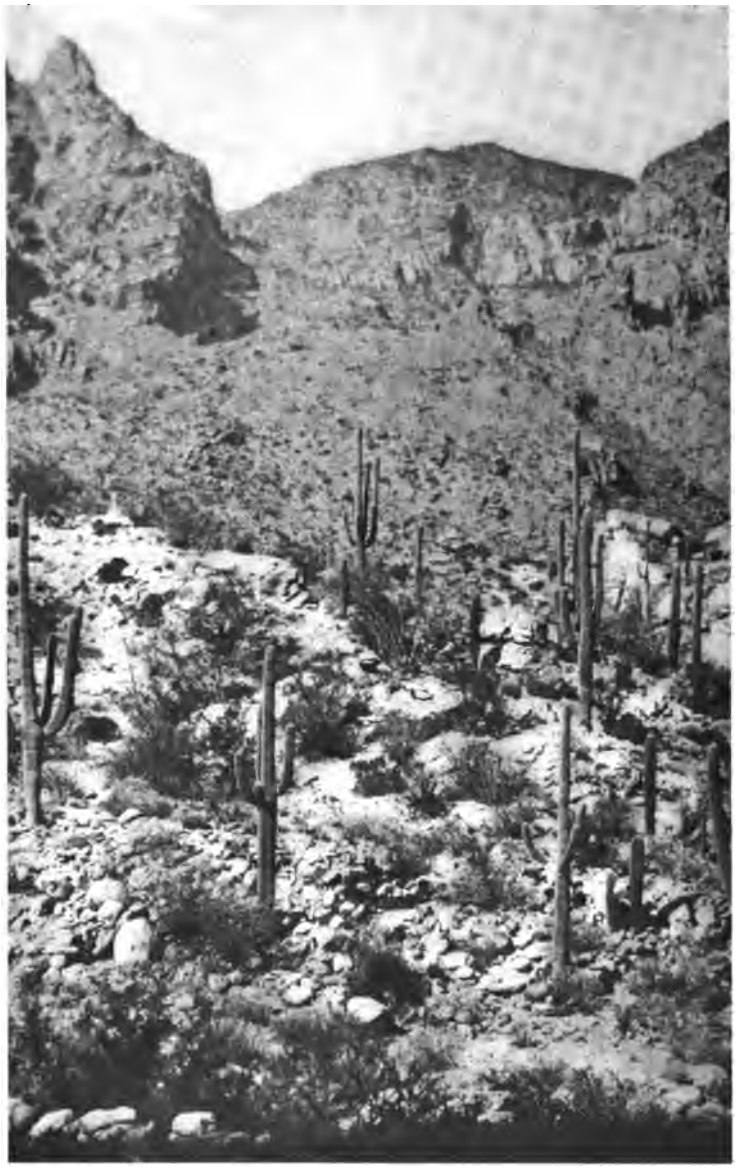
Gradually less care is used, and finally anything but satisfying results are the outcome of their efforts. They cannot realize the fault is due to carelessness, so they keep on for a while and then, perhaps, send their negatives to a photographer or supply house for development. They come back too dense, too thin, or perhaps there may be one or two good negatives in the lot.

It is probably impossible for the operator to tell under what condition exposures were made, nor can he tell what exposures were given or even the stop used, no record being kept. He undoubtedly was not thinking of future results, but taking chances on the exposure about to be made.

After proceeding in this manner for any length of time discouragement is bound to come. The camera is given away or laid on the shelf to collect dust. The operator thinks it is a streak of bad luck, at any rate he decides photography is not for him.

This is where the greatest mistake is made. It is not a streak of bad luck. It is the best thing that could possibly happen. Even the starting point to his success if it is in him to try.

I would say to him, "The shelf is the best place for your camera at present, but don't climb up with it. Get busy—read and study good books and magazines on photography."



DESERT MOUNTAINS. WALTER C. AHRENS.

The days have passed when "Experience is the best teacher" in photography as we now have works written by men who have not only spent a great deal of money experimenting, but have given their entire life to the study. They have given us the benefit of their life-time work so we can learn by a few minutes of reading what it took them months of experimenting to discover.

There are many good works on photography and the branches thereof. One of the best for the amateur to purchase is a set of books published by the American School of Photography. This set consists of ten volumes and is well named "Complete Self Instructing Library of Practical Photography"; as it covers the art from the first steps to methods used by our most practical professionals. It is complete in every branch, and every branch is taken in its proper turn. There is not a question you could ask which is not fully and simply answered in this work. This set of books will save you a great deal more than their cost by reducing waste of materials, as instead of taking chances you will see your result by looking at the ground glass before making the exposure.

You cannot go wrong by looking into this work; at any rate get some good work on photography and also turn your attention to the monthly magazine question. Have your supply dealer secure for you copies of some of the leading magazines and get whatever ones you decide will benefit you most. I am very partial to "American Photography" published in Boston, on account of their untiring efforts to bring photography out of the record rut as you might well call it, and advance it into art where it rightfully belongs. Get a copy of this among others and look it over.

After you have studied the first principles of photography take your camera and try to follow every rule faithfully, and by all means look to the future, keeping a record of every move you make. Carry a memorandum book with you, and after you study your subject carefully and decide on the proper exposure and stop, jot it down in the book together with a note of the light conditions, etc., then make the exposure.

When you go into your dark-room and develop this negative you should note carefully how it works out. If any error has been made you can discover just where it occurred, and on the



WHAT'S THAT! *Copyright, 1904, by D. J. Bordeaux.*

next exposure of the same nature you will be able to modify time or stop accordingly.

Now for a word about spoiled negatives. If you would succeed, value a spoiled negative above the best in your files. Do not destroy it until you ascertain where you erred, recording your error to prevent spoiling another plate in a like manner.

Do your own developing, as the dark-room is where knowledge is gained. Use tray-development as that is the only method by which you will be able to see where errors occur. Development can also be controlled to a great extent when using this method.

The most important rule to fix firmly in your mind is—"Keep your dark-room clean." Keep everything in place, and you will be able to lay your hand on anything you want at the moment you need it. Use, also, none but pure chemicals as

this is the main reason for a clean dark-room. If the dark-room is allowed to become dusty and dirty, specks of impurities are apt to get into the developer, ruining your negatives. Special care should be taken to keep the room free from dust of dry Hypo.

Assure yourself also that the water used for washing as well as for mixing your chemicals is pure. Much trouble can result from impure water. Great care should be used in testing the temperature of the chemicals used and also that of the water. The temperature of the washing water should be as near that of the chemicals as possible. Preferably cooler than warmer. If necessary to use ice to cool the chemicals do not put it in the solution, but place cracked or shaved ice in a pan larger than the tray and set the tray in this until the desired temperature is secured. The reasons for this are: First—There may be some impurities in the ice which will spoil the chemical bath. Second—The melting ice (if allowance has not been made) will weaken the solution.

It is hard to come to a stopping point when one starts telling what should and should not be done in photography, and as this has been covered by more able writers it is best you should get it direct from them.

You may wonder why I make the statement that discouragement is the best thing that could happen to an amateur photographer. These are my reasons. If you kept on making exposures according to the meager and incomplete instructions received with your instrument, you would undoubtedly get good results (provided proper development was given), but you would stay in that rut and would not advance. You would become self satisfied when working in the first stage only.

To conclude, be ever persistent with your "Whys" in your studies and reading. If you are advised to do one thing or another ascertain WHY before you proceed.

If you will only be persistent for a short time, you will become so enthusiastic over the art of photography that your camera will never be allowed to collect dust again.



THE GREAT KINGFISHER. ERNEST A. BRAY.

A HOME MADE TELESCOPE AND OPTICAL STAND

By HENRY F. RAESS

ONE day while passing an optician's shop I noticed a photographer's tripod holding a pair of binoculars, the whole forming a sort of "telescope and stand."

As I had recently acquired a ten-power prism binocular this arrangement attracted my attention. On inquiring I found it to be "Made in Germany" and the price $10. They would not sell a part of the apparatus and I needed only the clamp. I already possessed six tripods and so did not feel like investing in another, besides the cost seemed rather high for the stand and clamp.

It is almost impossible to hold a ten-power glass steady by hand on account of its high magnifying power, and I had been thinking of some scheme for holding it. The above imported stand gave me the idea from which the stand (Figure 1) mentioned below was evolved.

The most difficult thing was a suitable clamp for holding the binocular. I went to a chemical apparatus house and looked over their collection of clamps, especially those used for holding condensers, and soon found one which seemed to be just right. It possessed a universal motion and could be turned in any direction, costing about $1.

The next thing was to fasten the clamp to the tripod. As the clamp was made to fasten to a vertical rod a similar arrangement had to be made for the tripod. This was easily done by having a machinist turn a brass rod twelve inches in length and one-half inch thick, excepting one end which was, for a distance of one and one-half inches, one inch thick. The larger end was tapped to receive a tripod screw. The brass rod was screwed to the tripod head and the clamp then fastened to it. As the rod was of some length the clamp could be raised or lowered and tightened at any point.

In order that the pressure of the clamp should not mar the barrel of the binocular it was wrapped (the binocular) with



Figure 1.

a piece of soft leather. On one edge had been sewed two skirt fasteners. This permitted its easy removal, or it could be left on, as it did not interfere in any way.

The telescope (Figure 2) was intended only for astronomical purposes, as it gave an inverted (upside down) image. It was made from a single combination of a 13-inch rapid rectilinear lens and a Huyghenien eyepiece.

For the telescope tubes common paper mailing tubes were used and the eyepiece inserted by rolling cardboard around it until it fitted the tube. Most optical instruments use Huyghenien eyepieces, such as astronomical and reading telescopes, microscopes, etc., or one may be purchased quite cheaply.

A fifteen-power, which is the highest power made in this



Figure 2.

country, costs not over $1.50. This is the kind used by the author. For experimental purposes the paper mailing tubes do very well, as they are cheap and light in weight.

When real serious work is contemplated the usual brass tubes are better. As a compromise some "tin" leader pipe may be had from a tinsmith. The latter tubes are cheap and light and do very well. A simple way to blacken the inside is to use a thin glue or gelatine solution to which a small quantity of molasses, glucose syrup or even glycerine has been added to prevent the coating from becoming brittle and peeling off. As a black pigment lampblack does very well.

Occasionally on looking at a bright object some difficulty will be found in focusing it sharply. In that case one or two diaphragms must be put in the tube near the objective.



MISS F. Harry Hendrickson.





Figure 2.

BENCH ENDS.

Illustrating Article "Record Work," by E. Claypole.

RECORD WORK

By E. CLAYPOLE

IN company with I suppose most amateur photographers, who ride their hobby-horse in anything like a wholehearted manner, I have suffered the usual symptoms of the fever during the course of which the changes have been wrung on most of the processes under the phases of landscape, portraiture, architecture, etc., until the day came when nothing seemed to satisfy and one longed for some settled course to pursue with an end in view and a feeling of "something attempted, something done."

Chance led me to select as my motif for future work the recording, by means of the camera, of the wealth of interesting detail work to be found here in the old country in our Cathedrals and grand old parish churches; features that can-



AT THE WINDOW. DR. F. DETLEFSEN.

not be equalled anywhere, memories of the past grouping themselves round edifices in which are embodied the hopes and efforts of a thousand years, showing us at every stage the joys, sorrows, exultation, and despair; the record of the life and faith of the nation.

Wander where you will from Kirkwall to St. Michael's Mount, throughout the length and breadth of the country, no two churches will be found exactly alike; similarity of design according to the period of erection may be present, but in each and all some particular and outstanding feature will present itself. Here a grotesque or gargoyle (Figure 1) finely carved in its hideousness representing the evil spirits being driven from the sacred building by the power of the sacraments ministered within, or as in a village church I have in mind where by some strange mood of its builder the nave is decorated by a series of heads which, commencing from the west, develop in four stages the expression of a broad grin. Another has a fine set of misereres, or finely carved bench ends (Figure

2), fonts, rood-screens, sedilia, piscinæ, pulpits; none alike and all in abundance.

I venture to suggest to our American cousins that instead of flinging themselves into a whirl of sight-seeing, snapping here and there at general views which doubtless could be secured infinitely better, through the medium of the commercial post card, they devote their opportunity to securing negatives of the interesting old "bits" I have mentioned, the possession of which I feel will bring more pleasure, not only to themselves, but to their friends, than would a host of uninteresting "snap-shots."



Figure 1.
A GARGOYLE.
Illustrating Article "Record Work," by E. Claypole.

FIRST PRINCIPLES OF SUCCESS

By H. M. GASSMAN

IN taking up photography it is no wonder that the average beginner becomes very much discouraged at the large amount of detail which he thinks must be mastered before he can make a success of the subject. This probably explains why so many have not taken up the work of developing their own pictures, but turn such work over to professionals who do it at very reasonable prices.

I have never considered this large amount of detail necessary for the average beginner, and have, therefore, picked out the most important and called them the "First Principles of Success."

It is my purpose to discuss only the mechanical and chemical processes involved in picture taking, leaving the artistic for separate treatment. It is impossible to present in short space, if at all, principles governing the artistic side of photography.

The mechanical processes relate largely to the taking of the picture, and the chemical processes to the making of the picture after the exposure has been made. The following will be considered under picture taking:

Lens.—It is this part of the camera which is the vital element and which distinguishes cheap cameras from expensive ones. The expensive lenses give better detail, approach nearer to giving a correct image, and work at a greater speed than the cheaper lenses. Assuming that the lens is a fixed part of the camera, there is very little to do other than master its use under all conditions. It is, of course, important that the lens should be kept clean from fog, dirt and dust; otherwise the speed may be considerably less than normal.

Light.—The effect of the light on the plate or film will depend upon the amount of light passed by the lens and the quality of the light. A camera is sensitive to certain kinds of light to which the eye is not particularly sensitive. What may



ALPINE PASTURES. **Louis J. Steele.**



therefore appear bright to the eye at the time the picture is taken, may in reality be dark to the camera. The light at the seashore is very bright and penetrating, whereas the light reflected from dark colored objects such as green grass, trees, and dark buildings, is very poor from a photographic standpoint; also, the light early and late in the day is very much darker in its effect than the light near noon time. The light in summer is very much brighter than in winter for the same time of day.

Time of Exposure.—The time of exposure is usually regulated by a shutter automatically, or by pressing the bulb. The exposure must be timed in connection with the amount of light, whether the object is moving or stationary and the size of stop in lens. The larger the stop the shorter should be the exposure, vice versa. In making time exposures the smallest stops are commonly used.

Focus and Distance.—If the camera does not have a fixed focus some provision is made for moving the lens or plate back and forth so as to make the image distinct over the entire plate. It is very important to set the camera for the correct focus before making the exposure. It must also be borne in mind that the camera is near sighted, and that objects at a great distance will appear very small. The two extremes to be avoided are, having the object too far away, in which case it will probably be too small to be seen readily, and the other having the object too close, in which case it may not be possible to secure a clear image, if the lens is unable to focus for such a short distance, or the image may be partly off one side of the plate or otherwise distorted.

Fixed Position of Camera.—Unless the camera is fixed so that it remains perfectly steady during an exposure the entire image will be blurred.

Camera Position.—The appearance of a picture depends largely upon the position of the camera. The camera may be pointed down so as to include too much foreground, or may be pointed up and include too much sky; or in case it is not level in taking pictures of buildings the vertical lines of the building will tend to slant towards each other. If camera is pointed so that the sun shines in the lens the picture will very likely be a failure.

Stray Light.—If the camera leaks, that is, daylight gets into the plate or film, the picture will never show up, or will show streaks; in either case it will be ruined. This same thing will be true in case the film or plate is accidentally exposed before it is put into the camera.

Method.—One of the first principles of success is to have a given method of procedure to follow whenever taking a picture. The writer finds the following to work very satisfactorily:

1st—Focus.
2nd—Adjust shutter.
3rd—Insert plate or film.
4th—Expose.

Everyone who has had experience in making his own solutions will appreciate that in the present day the stock preparations are the means of eliminating a great deal of the troublesome details of the earlier days. In picture making nowadays, we can mention these essentials.

Cleanliness.—I place this principle foremost in developing work, because more prints are ruined due to lack of cleanliness than almost any other one cause. Developing trays should be free from dust and dirt, and positively free from any hypo solution. The same is true of one's hands all during the development proceedings. It is so easy to carry a little hypo, either in crystalline or liquid form, from one tray to the other and to the printing paper, film or plate.

Fresh Solutions.—It may seem more expensive to use new solution each time you are developing and printing, but as a matter of fact it is in reality cheaper considering the waste of time and prints or negatives when old solutions are used.

Quantity.—There should be sufficient developer and hypo solution to cover thoroughly the films or prints and to do the work without becoming exhausted.

Temperature of Solution.—All solutions, should be moderately cool and not differ very much from each other in temperature. This also applies to the temperature of the washing water. Where there is a great difference in temperature, such as lukewarm to ice cold, there is apt to be trouble with the print or film during some part of the process. The developing



TOILERS OF THE FIELD. CESARE L. LUZZATTI.

room also should be as cool and well ventilated as possible to secure the best results.

Stray Light.—When developing films or plates it is very essential that nothing except a safe red light be allowed in the room. Sometimes there are small streaks of daylight or artificial light entering the room which will prove injurious to any plates or films undeveloped. The light to be used with developing papers will depend on the kind of paper. It is a safe rule to protect the paper as much as possible while transferring it from the package to the printing frame and to the developing solution.

Correct Exposure.—The results with developing paper depend very much upon the exposure. An over-exposure will produce black prints without contrast, and under-exposure will produce a print which is harsh and lacking in many of the details. The time of exposure depends on the quality and amount of light, distance of the negative from the light and the density of the film or plate.

Fresh Paper.—It is obviously impossible to secure the best results with paper that has deteriorated by age or chemical action. Before using paper it is well to try small strips to see if it will blacken in the developer without being exposed to the light. It is also a good plan to expose a strip of the developing paper to the action of the light in the dark room for as long a time as it takes to develop a print; if the paper shows up dark in the developer the light is not safe and should be reduced in quantity or changed to a deeper red if plates or films are injured.

It is admitted that while these principles are, possibly, very clear, the applying of them is rather difficult, especially where the beginner has not had any experience on which to base his judgment of the various processes. After all, it is a question largely of "cut and try" that is, experimenting to find what gives best results and then follow the same order of detail each time. If any variations are to be made one should be introduced at a time so that its effect may be checked up and thoroughly understood before introducing another, having an effect in the same or opposite direction.



PORTRAIT. CLARISSA HOVEY.

SOME DARK-ROOM DODGES

By ROY HARRISON DANFORTH

WHAT may most simplify the purely mechanical processes of photography, and leave the worker untrammeled for the execution of his more artistic tasks, has always seemed to me the most advisable objective, whether in the field, the studio or the dark-room. Especially is this so for the amateur to whom the mechanical tactics prove the first, perhaps greatest, stumbling block. Planning a dark-room in a new home recently, therefore, I took care that it be comparatively small. I could thus reach every corner easily from where I stood before the sink—and I had a good excuse for refusing admittance to interested but potentially troublesome friends.

The primary problems of ventilation, darkness and safe light were easily solved. The carpenters had been unable to understand the meaning of "perfect darkness," but I made up for their shortcomings by stopping the cracks in the doors with the black wadding that comes wrapped about Tungsten lights, one of which I bought for use in my enlarger. Under the end of the sink, and at the top of the opposite wall, I bored rows of holes with bit and brace. Above these I nailed a strip of wood at right angles, glueing along its outer edge strips of the black paper that comes about bromide and gaslight papers. Beneath the holes I nailed another strip of wood, a little wider than the first, with a piece at right angles to this so that it was parallel to the black paper and a couple inches farther



A *B* *C*

Figure 1.

from the wall. This cut off the light in two directions but left a free circulation of air. An outside window, equipped with red glass, gave me light enough by day.

At night, when most of my work is done after office hours, I needed another equipment, and as my films are developed by Eastman tank, an orange light was sufficient for all processes. This I obtained by cutting away the sides of a tin coffee can (Figure 1-A) with the exception of half an inch of the tin on either side, and wrapping the can about with orange fabric. In the cover I cut a slot at the side just large enough to admit the cord of an incandescent light. I found that with gaslight papers the cover could be safely left off, but was needed with bromide paper.

There are so many possible kinds of enlarging apparatus



THE LEGHORN HAT. G. T. Harris.



the amateur may make I need tell little about mine; except that I immediately abandoned the idea of a daylight enlarger because daylight is so variable, and because I wanted to do most of my work evenings. A Tungsten light of 150 watts is my vicarious sun, and it gives me an 8 x 10 enlargement from an ordinary negative in twenty seconds, which is quick enough for most amateurs.

As I use films exclusively the means of holding the film in the proper place was to be sought. I sawed a groove longitudinally in the side of a board of the necessary width and length (Figure 1-B) and into this slid a piece of clear glass the requisite size. Putty in the groove on both sides of the glass hardened in three days and made the glass immovable. To one side of this glass I affixed another by means of a piece of strong black cloth glued to both. In pieces of the black paper mentioned before of necessary size I cut openings agreeing with the dimensions of my films and glued these papers to the two pieces of glass with the openings opposite each other for masks. Between the glasses the film would easily slide and the unhinged ends of the glasses could be caught together with a clip. This clip I made with a stiff hairpin, bending the pointed ends outward in the same line with each other for the distance of an inch and the looped end back against itself.

A hairpin straightened out, one end bent into a loop and the other thrust in and out of a piece of cardboard or cotton of any size, made a handy dodger for use in enlarging. In cutting the masks for this and other purposes I easily made a handy little tool with a piece of lath and a safety razor blade, nailing the blade along the edge of the lath so that a quarter of an inch of the blade projected.

Numerous other little dodges of equal simplicity and utility I have made that may be briefly mentioned. By removing the brass rim from one end of a film spindle and nailing the spindle to a shelf by nails through the rim on the other end, I made a graduate rack (Figure 1-C). The graduate inverted over this would drain and could not be knocked off and broken.

Another spindle, both brass tips being removed, would just serve as the core of a squeegee. A piece of half-inch hose of

the necessary length slipped over it and was glued in place, while a piece of stiff wire, easily bent to the requisite shape. formed a handle. Two other spindles with the ends removed, nailed to the shelf beside my sink made an excellent pivot on which to balance the fixing box so it could easily rock from side to side.

For stock pyro solutions and others I use beer bottles with the familiar patent rubber stoppers. These close the bottles tightly and reduce oxidation to a minimum. My developer for bromide and gaslight papers I make up in rather concentrated stock, bottling it in four-ounce bottles and dipping the necks of the corked bottles into melted paraffine to seal them. I thus expose to oxidation only a small portion of the stock at a time which is easily used up before it is spoiled. When the fixing bath has thrown down a precipitate of sulphur, I pour carefully off the clear liquid at the top, wash away the precipitate and replace the clear fluid. This keeps the negatives and prints cleaner.

A quantity of small shot I keep near to clean out bottles, shaking this around in the bottles while washing them. The handiest chemical in my dark room is a bottle of hydrochloric acid. Slightly diluted it eats the dirt out of glass and porcelain ware and removes film from old plates. Greatly diluted it removes copying ink or typewriter ink from the fingers and often is effective in taking pyro stains out of negatives.

Bulking these little dodges together in an article this way may give an impression of my dark-room as a receptacle for junk the trouble in making which is not repaid by its utility. The truth is quite the contrary. I have made the things in a few minutes from time to time as I needed them, and not one of the lot has proved of less practical than theoretical value. Many of them could be replaced by substitutes bought on the market, but the reduction of expense and the joy of invention are the chief reasons for their being.



PORTRAIT STUDY. J. F. WILDE.

WHERE NUDE PHOTOGRAPHY IS PRACTICAL

By GEO. D. JOPSON

THE progress that is being made in artistic photography is phenomenal. It is now an art equal, if not superior, to that of the painter or the sculptor.

The camera in the hands of a conscientious worker who possesses artistic skill is a greater factor in art than the pallette and brush or the mallet and chisel.

We have in the photographic ranks workers who have created schools peculiar to their individual tastes and needs. Amongst the professionals there is the photographer of men, Pirie MacDonald; the photographer of women, Dudley Hoyt; the photographer of children, "Pop" Core, each one a man of not only local but of world wide fame who concentrates his energy in one direction, each adhering to a school peculiar to his individual taste and artistic ability.

In the advanced ranks of the amateurs we find men and women working exclusively along one line of thought—concentrating their energy in their chosen direction so that they have caused the world (photographic) "to sit up and take notice."

A number of recognized workers in both the professional and amateur ranks have given to us artistic conceptions of nude photography—handling the subject with such artistic skill that the nudity of the model is lost sight of and nothing remains to be seen by the artistic eye but the harmony of a photographic thought and composition.

Amongst the professionals "Jack" Garo and Elias Goldensky, both capable and sympathetic artists, have given us some charming nude studies; not mere records or maps, but have used the camera as a legitimate medium for the artistic portrayal of the human form.

For sympathetic handling of this delicate work the most



Figure 1.

FLOWER BABIES. KATE SMITH.

Illustrating Article "Where Nude Photography is Practical," by Geo. D. Jopson.

beautiful results are obtained by the women workers. A model who naturally must be refined does not feel the restraint when posing for an artist of her own sex that she is apt to feel when posing for one of the opposite.

Of late years about the only studies that can be classed amongst the nudes that have appeared in the ANNUAL are those by Miss Kate Smith, an artist who represents nature in an ideal manner as it appears to the imagination, brings out the soul of the person and the sentiment of the scene depicted. Such is ideal work of nude photography. Mere maps of the human form are degrading and if the worker cannot reach beyond that point—drop it and take up another field.

Miss Kate Smith's studies appeal to the refined instincts of the observer and awaken an intellectual understanding and poetic feeling of the subject she has depicted. We can recognize in her work a school that distinctively belongs to her, a photographic school of her own creation, one that carries us back to ancient Mythology, and the beautiful fairy tales that mother or nurse used to tell us before our sleeping hours in childhood days to lure to their aid the neglectful gods of drowsiness. Her "Flower Babies" (Figure 1) is such a study.

We look at the beautiful arrangement, the correct distribution of the "Babies" from the little tot to the grown-up, all unconscious of the camera near by. Possibly the grown-up fairy is telling the little fairies some pleasant tales, for the pleased expressions denote that.

"The Woodland Pool" (Figure 2) is one of those mysterious impressions, a well balanced picture that has a strong appeal and fascination. The woodland nymph, a phantom figure, is about to step into the cooling pool of water, possibly for aught we know to visit her neighbor the water nymph.

Miss Smith loaned me a number of her studies from which to select one or two to illustrate this article. Owing to the faultless technique of each picture it is difficult to confine one's self to only two studies, for the lights and shadows are so delicately blended, and the half tones and middle tints blend in such even gradations they hold one enchanted.

As Miss Smith's home is in England and mine is on the banks of the Hudson I will brave the consequences and appropriate one additional subject.



Figure 2.

THE WOODLAND POOL. KATE SMITH.

Illustrating Article "Where Nude Photography is Practical," by Geo. D. Jopson.

"The Enchanted Wood" (Figure 3) has everything to commend it. Like all of Miss Smith's studies it has the appearance of being hundreds, yes, thousands of miles from human habitation. The imagination easily enters this picture. The reader can easily weave a myth around this enchanted spot.

There is quality throughout. The high lights and shadows on the Naiad are beautifully blended and the richness is reflected in the water. If the figure was not there it would be nothing more than a record. If the figure was clothed there would be no allegory. The figure is placed the proper distance in the picture to create enough mystery so that a charming story can readily respond to the imaginative mind. The title is well selected and one cannot help being enchanted when studying this well arranged fable.

Miss Smith's studies appeal to the writer as illustrating where nude photography is practical. It is a delicate subject to handle. When there is no story to tell it is at once an offensive proposition. When it is introduced to complete a little fairy tale, made in the open air amid surroundings that are entirely void, to all appearances, of the encroachment of human beings, then it is artistically uplifting as well as practical.



TEMPLE OF NEPTUNE. DR. G. W. ALLYN.



Figure 3.

THE ENCHANTED WOOD. KATE SMITH.

Illustrating Article "Where Nude Photography is Practical," by Geo. D. Jopson.



A SUMMER AFTERNOON. A. B. STEBBINS.

WASHING BROMIDE ENLARGEMENTS

By JOHN D. ELLIOTT

BROMIDE enlargements that are made on large paper twelve by twenty inches or eight by ten inches are troublesome to wash. If put in a tub they revolve like a wind mill and are not evenly soaked by the water. As a better way the following plan was tried, and found satisfactory.

As five or six enlargements are about all that can be done



ON LAC LEMAN. MARGARET L. BODINE.



Figure 1.

in one night, this plan is only intended for that number. A tank or box is made about eight inches wide two feet long and 24 inches deep. All that is required is room enough to hang the enlargement from a chalkline or wire. The line is stretched from one end of the box to the other end and as many lines can be used as desired—the lines should be about an inch apart.

The water can be let in by a hose from the bottom or the top. The prints or enlargements are hung on the lines by little McKee plated clips, the kind they hang up cards in show windows.

They are about one inch long and have a hook on the end, and on the opposite side or bottom of the print several split shot are fastened to the paper by squeezing them with pliers? Figure I.

When the washing is finished the prints are hung on a line to dry and they dry with very little curling.



THE LAST FURROW. ERNEST A. BRAY.

A METHOD OF READILY ELIMINATING HYPO

By C. M. SHIPMAN

SO many of the newer processes in photography depend for their success on the complete elimination of the "hypo" (thiosulphate of soda) from plates and prints that a series of experiments to determine the easiest and simplest method of accomplishing this was carried out.

The several methods, Javelle water, potassium permanganate, percarbonates, etc., and hydrogen dioxide and others were tried, and the last named was selected as being the best and simplest, leaving no residue, decomposing into water, and oxygen being given off in the process.

It is understood that the hydrogen peroxide used must be of good quality. In these experiments Dioxogen was used. Merck's perhydrol may be used, but it is expensive for our purpose. Where acetanelid is used as a preservative in the peroxide there is a breaking up of this compound by the peroxide forming acid, which, together with the acid already in peroxides, if used it is very likely to injure the print or plate.

The method of procedure was as follows:

A half-dozen 5 x 7 prints of different brands were exposed, etc., put through the hypo bath and rinsed for one minute in a tray containing 1000 c.c. of water. The prints were then placed in another tray containing 100 c.c. of 12 vol. hydrogen peroxide to 200 c.c. of water and moved about for three or four minutes; then rinsed in water a few minutes.

The prints were then torn to small pieces and the water from them tested for the presence of unchanged hypo still in the prints with blue starch-paper (described later). The result—no indication of unchanged hypo.

It is the opinion of Stolze that a good hypo eliminator is better than prolonged washing, even if there is no after-process, and the above seems to be the most satisfactory way to accomplish it.



BLOSSOMS. C. M. SHIPMAN.

A good test for the presence of hypo is the following:

1 litre of water.
1 gram c.p. NaOH.
0.1 gram $KMnO_4$.

Ten or fifteen c.c of this solution placed in a test tube, and a few drops of suspected water put in and shook up, will show presence of hypo if it turns greenish or purplish. This test, however, cannot be used in the above process, as it is acted upon by the hydrogen dioxide, so the test paper referred to above is used. It is made as follows:

Three of four grams of starch are rubbed up in a little water and thrown in 300 c.c. of boiling water and cooled. Then take 150 c.c. or so of this solution and stir in a flat dish with 20 c.c. of potassium iodide 10 per cent solution. Now add 5 or 6 c.c. of the hydrogen dioxide, and the solution turns blue.

Draw pieces of filter paper through this solution and dry. Small strips of this paper held under the dripping plates or prints, if bleached white, indicates the presence of hypo still in them. If the paper has lost its blue color by keeping some time on moistening it will turn blue again and may then be used as above.

It is said by Rouiller that the action of hydrogen dioxide on sodium thiosulphate in the presence of insoluble metallic oxides is as follows:

$Na_2S_2O_3 + H_2O_2 = 2NaOH + S_2O_3$, the S_2O_3 then reacting with more H_2O_2 according to the equation $4S_2O_3 + 5H_2O_2 = H_2S_4O_6 + 4H_2SO_4$, or, if temperature is a little high, $4S_2O_3 + 5H_2O_2 = H_2S_3O_6 + 4H_2SO_4 + S$.

We lean to the simpler reaction: $2H_2O_2 + Na_2S_2O_3 = Na_2SO_4$ and sodium trithionate. There certainly seems to be no evidence of free sulphur. I think the H_2SO_4 of his formula was in the H_2O_2 as an impurity to start with.



FRANK. **Mary Carnell.**

PLATES OR FILMS

By HARRY GORDON WILSON

GENERALLY, one of the first questions one is asked is: "Shall I get a plate or a film camera?" To me the plate outfit, together with the focusing camera, is entirely out of date with the progressive amateur, just as the hand-tray development is. The roll film, distance scale Kodak fitted with the direct-view finder and tank is the ideal outfit, if used with a little head work, as the operator of either a Kodak or plate camera who desires to obtain a good negative with either plates or films must invariably use his own common sense in determining the correct exposure, and in case he fails the instrument used should not be blamed.

It is a common fault with the majority of photographic dealers that in selling a photographic outfit they fail to explain to the buyer that the instrument cannot do the work unaided. The buyer is furnished with the outfit that his pocketbook allows, no definite instructions are given and consequently the operator, possibly not taking the time to read and properly digest the small instruction book that is given with the purchase, meets with a great many failures, and the blame in most cases is laid to the instrument.

Fifteen years ago I was the proud possessor of a heavy 5 by 7 plate camera. It was with me on all of my travels, and many is the time on a hot Summer day that I had the idea I had found a very pretty bit to photograph. I unstrapped and set up the heavy three-legged tripod, took the camera out of the case, buried my head under the thick, suffocating folds of the focusing cloth and looked on the screen. The picture did not look then as I had a notion it would. I turned the camera this way and that, still not satisfied. I then had to unfasten the camera, put that back in the case, unjointed the tripod, strapped that affair up and continued my walk. Carrying a 5 by 7 box with six double plate holders (filled), the black



A STREET IN THE VILLAGE OF LEVIS. HARRY GORDON WILSON.

cloth and tripod, is quite a little load, I assure you. Suppose you desire to use plates and develop in the tank, how heavy and bulky they are to take care of afterwards. The plate man is invariably forced to do some work in the dark room.

Now I am out of all that mess with a No. 3-A Kodak, Zeiss lenses, roll film and tank development; everything is very easy. With a roll of ten exposures in the Kodak, two or three rolls in the pocket and a little metal tripod in its case over the shoulder, with the direct-view finder, which shows the image much clearer and three or four times larger than the small affair fitted to the lens board of the Kodak, one can view the subject by holding the finder in the hand on a level with the eyes and so determine if it is what he wants or not without even taking the Kodak out of its case. Some will say that the distance scale cannot be depended upon. I say yes, that it can, if you

use a little common sense in estimating the distance. I may add, in my own personal use of the focusing Kodak and roll film for the last ten years, that the only failures I have had were due to errors of judgment, and not due to the Kodak.

Some will say that they mark each plate holder with the time of exposure and then develop each plate to suit the exposure. Now, a poorly exposed plate will generally make a poor negative, however developed; all the forcing in development will not improve it. At this point in using the roll film a reasonably fair exposure developed in the tank will bring better results than development by hand. Two years ago I made over four hundred exposures in Canada, all on roll film, and developed in the tank. I only lost four, on account of not pulling out the lens to the required scale distance. They consisted of exposure of from 1/300 second to a time exposure of 20 seconds in sunshine and rain, exteriors and interiors, all tanked same time, 20 minutes. Films cost a little more than plates, but you have the convenience, and that is certainly worth something. Working with the Kodak and films is a pleasure; on the other hand, using a plate camera and accessories is a bother. Cut film in the pack is rather mussy and is not to be compared with the roll film.



JULES VEDRINES WINNING THE GORDON BENNETT CUP. HARRY GORDON WILSON.

STEREOSCOPIC TRANSPARENCIES

By HENRY C. DELERY

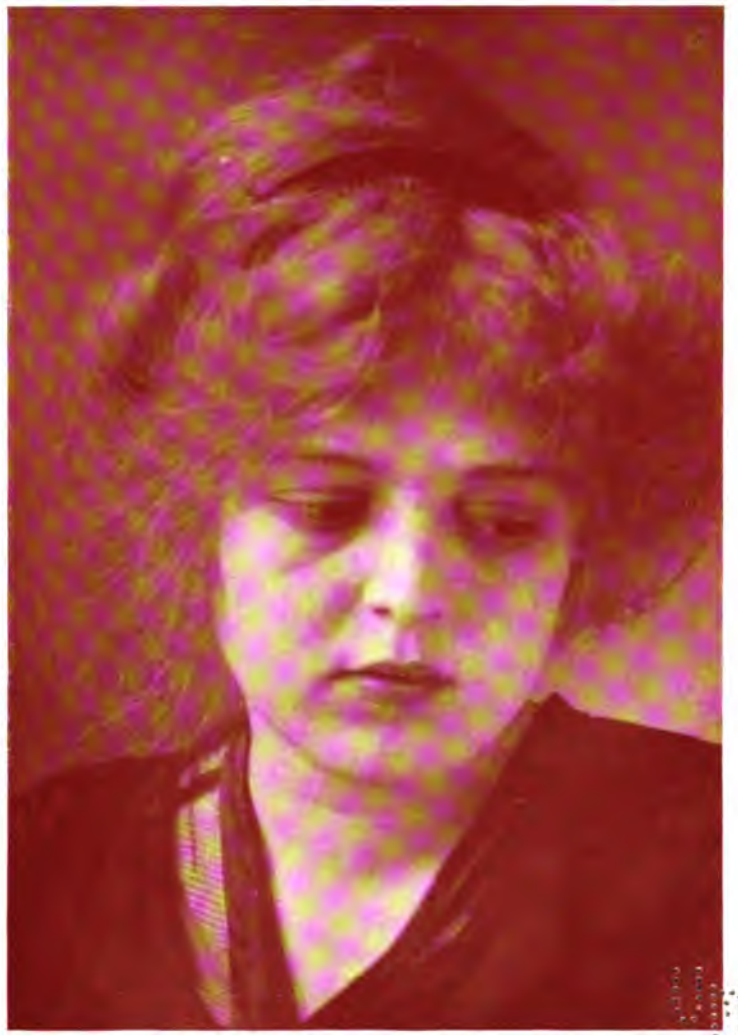
IT is generally conceded that through the stereoscope, photography has found its most realistic and interesting mode of expression, and though a subject may lack artistic composition, and even be of imperfect technique, still when viewed through the steroscope, this same subject arouses our interest and often our admiration.

The usual method heretofore has been to print stereoscopic pictures on paper, the best results being obtained with a glossy paper highly polished, and even then the grain of the paper is apt to be seen and tends to mar the effect of the view.

A perfect stereoscopic picture should be one that, when seen in the instrument, it would appear that we are looking at nature itself, without the interposition of any medium, and produce the same appearance as, for instance, if we were looking at a view through an open window.

The best medium for such an effect, is when the pictures are made on glass transparencies, and it is to be wondered that this process is not in more general use. By the employment of dyes or other agents, the slides may be toned in several colors (in monochrome of course) appropriate to the nature of the subject, and yielding results that one almost forgets that he is looking at a photograph so realistic is the scene, and the impression is rather as if one saw the view without the interference of the camera or lens.

Perhaps the objection to the practice of this mode of reproduction comes from the fear of elaborate processes which consume both time and money; but a trial will soon convince that this process is perhaps simpler, taking less time and gives far better results, and the slight extra expense that may be entailed



A PORTRAIT. **Harry D. Williar.**



is more than justified by the beautiful effects which may be obtained.

There are three methods by which stereoscopic pictures can be made on glass.

1st. By photographing the negative with the camera,

2nd. By direct printing with the transposing frame,

3rd. By printing with the ordinary lantern slide plates.

The first process of course is the best, the one which reproduces the picture exactly as when seen through the camera, and without the usual bother of transposing the right and left views.

To properly reproduce the picture, the negative must be photographed in the same manner as when making lantern

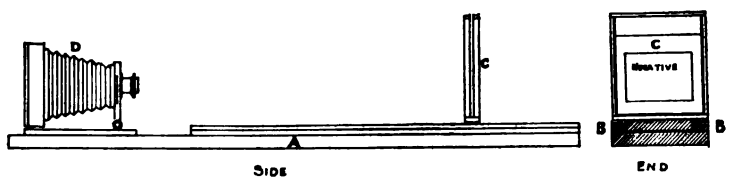


Figure 1.

slides, but with this exception, that the stereoscopic camera must be employed in place of the single lens. It is not necessary to have an elaborate reducing camera for this purpose—a simple arrangement as shown in the illustration (Figure 1) will suffice.

A board "A" about ten inches wide and five feet long is provided with grooves "B" made with slats nailed together in which slides the negative carrier "C" in which is placed the 5 x 7 plate. If films are used, they are set between two glass plates. The camera is held in position at "D" with tripod screw; when making the exposure, a black cloth is placed over space between the camera and negative carrier to exclude all extraneous light.

To make the exposure the negative is placed in the carrier "C" in the same relative position which it occupied when making the original picture in the field; that is, upside down and film outward, or with the glass side of the negative facing the camera. When thus arranged the right-hand picture as

seen by the right-hand lens is turned to its natural position; and so with the left-hand picture. The subsequent process of developing is, of course, the same as for lantern plates.

The second method, that of using the transposing frame, is well known to many and needs very little mention here. The printing frame should be about one and one-half times the length of the negative. A mask of cardboard, corresponding to the size of one of the stereoscopic views, is placed in the frame so that the opening is exactly in the center. The negative is then set over the mask in the frame, exposing only one view, say, the right-hand picture. This is covered with the transparency plate in such a manner that it will occupy the opposite end to that of the negative. After exposure the negative is shifted to center, the left-hand picture over the opening of the mask and the lantern plate also moved to bring the unexposed part in contact with the negative, thus transposing the two views to their correct position.

It is obviously necessary with the foregoing methods to use transparency plates upon which to print the pictures; unfortunately, this is an article not readily obtainable, there being small demand for the same, and perhaps this is the most objectionable reason which deters many from attempting this beautiful process.

By the third method these objectionable features are eliminated and the whole work much simplified. This consists in employing the ordinary lantern plate. The negative is placed in the frame and the lantern plates (previously marked right and left so that they can be identified later) set on the negative as for a contact print; the exposure is made, and when all is finished all that is necessary is to mount the slides on a glass plate, using the usual double mask to frame each picture.

Lantern plates are 3¼ x 4 inches, hence by placing the plates with the 4-inch side vertical we have a slide 6½ inches wide by 4 inches high. For a cover glass an old negative from which the film has been removed can be cut down to 4 x 7 inches, which is the size of some standard card mounts.

Stereoscopic slides should be given a full exposure in order to obtain all detail possible and to avoid contrasts. The shadows may be deep, but should be transparent, and the high

lights have sufficient details so there will not be too much clear glass, which might produce chalkiness.

Very pretty results might be obtained if, after development, the slides are toned to a color appropriate to the subject, such as a dark green for a forest scene or a sepia for an architectural study.



THE BARN PUMP. CARLE SEMON.



Figure 1.

Illustrating Article "Neglected Opportunities In Interior Photography," by C. H. Claudy.



Figure 4.
Illustrating "Neglected Opportunities In Interior Photography," by C. H. Claudy.

NEGLECTED OPPORTUNITIES IN INTERIOR PHOTOGRAPHY

By C. H. CLAUDY

HE who makes a specialty of photographing interiors knows that to produce a really good result he must know something more than the mere mechanics of photography against the light and under conditions of uneven illumination—must bring to his work not only some sense of the fitness of things and some appreciation of the artist's point of view, but in addition must possess a sense of proportion and of values of mass as well as of light and shade.

It is in the absence of these things, rather than in lack of skill, that one must hunt for the reasons for so many unpleas-

ing interior photographs. It is lack of experience rather than lack of mere photographic knowledge which makes so many interior photographs but gravestones of dead opportunities.

For the purposes of the present story it is assumed that the interior photographer knows the essentials of such work—understands the use of a short-focus lens, the backed or non-halation plate, the flash in dark corners to even up illumination, the dark curtains outside of windows to cut off their light while the main exposure is made and which are removed for a short exposure getting the exterior, etc., etc. But a man may know all these things perfectly and yet make interior photographs which fail to please.

Perhaps the two things which militate against good interiors more than any others—poor photography excepted—are the usual attempt to include too much in the view—work the wide angle to death, in other words—and too much furniture, ornaments, chairs, etc. Next to these I would put the cutting off of the bottom or tops of objects in the view as an objectionable feature. One can include half a chair or the end of a couch or a fireplace without doing damage to the feelings of the beholder, but when it comes to slicing the legs off a table or the suspending pipe from a chandelier, the required effort of imagination on the part of the beholder so distracts him that he feels a sense of incompleteness and dissatisfaction which extends to the picture as a whole.

The remedies are obvious. While it is usually necessary to use a lens of moderately wide angle in making interiors, it is not necessary to crawl into a corner and try to get 180 degrees in the angle of view! To get too much on the plate dwarfs the proportions of everything in the picture and, as well, induces a violence of perspective which is always noticed even if the distortion cannot be named. As for too much furniture: The comfortably furnished apartment will look crowded in a picture, whereas by removing tables and chairs to the point of bareness the resulting picture will appear spacious and comfortable. Particularly is this wholesale removal of furniture to be practiced when said furniture is large and massive and so placed that one piece overlaps another. To see a part of one chair through another chair is to add to your picture a small Chinese puzzle, and not until the eye has satisfactorily



Figure 2.
Illustrating "Neglected Opportunities In Interior Photography," by C. H. Claudy.

untangled this will it rove to other and perhaps more attractive portions of the view.

As an example of some of these principles I call your attention to Figure 1. This interior is I-don't-know-where and made by I-don't-know-who, so if I hurt anyone's feelings in saying that it is poor I apologize in advance. In addition to being underexposed and poorly chosen as to viewpoint, be-

cause dividing the interest, we have a chandelier suspended from nothing visible, a chair, potted plant and settee inextricably mixed up, and a window-seat, cushion and window opening on blank white space all tangled together! The lines of the rugs are bad also, criss-crossing in uncanny style. The whole thing is a very badly neglected opportunity and fairly gives the beholder the headache to untangle and straighten it out!

In Figure 2 is an example of how-not-to-do-it which I am responsible for. I knew better, but—well, I did it. However, I did it again, as in Figure 3, which is much better. Figure 2 has two chairs lapping each other—I can see nothing but those chairs when I look at this. It seems to me that Figure 3, with one of those chairs missing, is much more satisfactory.

Of course it is not always possible, nor is it necessary, to have each piece of furniture silhouetted against a blank wall. In Figure 4, for instance, the chairs about the dining table seem natural—one expects chairs about a dining table—so that, even if the lines of legs and braces are somewhat tangled, the result is not offensive. But before I made this exposure I dragged a lot of extra side chairs out of the way, and if I had taken one more baby chair and the side chair against the window while I was about it, it would be a more artistic picture.

Will you, while at it, please note the fireplace? It's so easy —so very, very easy to burn half a sheet of newspaper on a log in a fireplace that to leave it smokeless and cold in a photograph seems a shame. It's but a tiny little touch, true, but neglect of it certainly comes under the title to this tale.

As for including much view or little, look at Figure 5. This is certainly simple enough and small enough in what it includes, yet I cannot see but what it is pleasing, even if it but shows half of one wall and a suggestion of another, has but one chair and a box for furniture and but the suggestion of the brick fireplace. Yet with all my pains and care to make this simple and suggestive of room and space I fell down woefully in one particular—I never even saw the fire extinguisher at the right, which, while necessary in reality, certainly adds nothing to the picture.

Now, I can see little else when I look at this example of how to forget one's business.



Figure 3.
Illustrating "Neglected Opportunities In Interior Photography," by C. H. Claudy.

It is a *sine qua non* to good interior work, of course, that photography be second nature; who has to stop to figure on purely photographic problems must necessarily have the less attention to give to those of proportion, mass, perspective and illumination. No matter how well conceived, properly balanced and well arranged a picture may be, if it is poorly photographed it loses half its charm. At that, I'd rather have a poor photograph well made as to composition, than Figure 1, for instance, perfectly photographed. But the good interior is both; it is a perfect piece of work photographically and without reproach pictorially. Of course no such picture has ever been made—but that is the ideal. We can all strive for the ideal anyway, even if we cannot reach it. If he who thinks making good interiors is nothing more than a wide angle lens and a long exposure will look at it in this light he will find that unknowingly he has been neglecting opportunities galore, and will, in his advanced point of view, find in interior work a pleasure and a field which is wide enough and big enough for the most exacting sigher after new fields photographic in which to roam.



ASTER AMELLUS AND WILLOW BY WATERSIDE. *Copyright by E. J. Wallis.*



Figure 5.
Illustrating "Neglected Opportunities In Interior Photography," by C. H. Claudy.



ROSES.

Illustrating Article "Flower Photography," by Chas. M. Smyth.

FLOWER PHOTOGRAPHY

By CHAS. M. SMYTH

A GREAT many camera enthusiasts no doubt have wished they might successfully photograph some beautiful flower, or vase of flowers, which they have at some time chanced to see or possess, and no doubt they have tried it with varying results, usually discouraging if it happens to be their first attempt.

There is only one requisite necessary to success and that is a bellows somewhat longer than that furnished on the ordinary hand camera. One might even do without that if possessed of a portrait attachment. A long bellows is necessary so as to enable the operator to get close enough to the flowers to give a large image on the plate.

There are three primary ideas to be adhered to in taking



LISTENING FOR SANTA CLAUS. FEDORA E. D. BROWN.

photographs of flowers: First, artistic arrangement of flowers; second, the procuring of a background which will not detract one's attention from the object; third, a good light. The first idea is indeed the most essential and will embrace a great many phrases. If posies are to be photographed in a vase, care should be taken not to get too many flowers nor to have them too closely bunched. Arrange them carelessly so as not to give a stiff appearance. If there be one flower among the lot which is ready to blow, shake it gently and allow a few petals to fall about the vase. An improvement is also attained by allowing even a whole flower to fall alongside the vase.

Then flowers of different character should be placed in a vase suitable to their particular construction. Those of slender build and with long stems ought not to be placed in a shallow vase. Likewise a large petaled flower, or one with a large head, would not look well in a tall, slender vase. Short stemmed posies, such as pansies, look best in a shallow or low vase. The placing of the vase is an item which should not be overlooked. Do not place it squarely in the center of the picture. It looks too much like looking at a person from a squarely front view. It is not difficult to so arrange the flowers as to create a well balanced picture with the vase at one side.

The second idea—the matter of a background—is easily solved. Take a large, rather stiff sheet of cardboard, preferably a sheet of mounting board or cover paper, and lay it flat upon the table. Place the vase of flowers rather close to the edge nearest the camera. Then raise the edge farthest from the camera, taking care not to upset the vase. Raise it slowly, curving the card and causing no sharp fold or crease, until the farthest edge comes above the topmost flower. Brace it there by placing an article behind it heavy enough to hold it in place. That gives a perfectly uniform background over the whole plate.

A sheet 20 x 24 should be large enough, but the size will, of course, depend entirely upon the size of the flowers, the vase and photographic plate. The cardboard should be large enough that none of the four edges will show upon the ground glass. A variety of backgrounds may be had. One that will contrast with the color of the flowers, or the vase, will answer



COSMOS.
Illustrating Article "Flower Photography," by Chas. M. Smyth.

the purpose to best advantage. White, black, rough, smooth or mottled effect may easily be produced in that manner.

The third idea—that of lighting—while essential, is not so difficult as the first. There should be light from above, but with a stronger sidelight. Beside a window with the shade run up is perhaps as good a place as any. There should be no decided shadow, but just enough to show that the vase is really resting upon something and not simply standing in the air.

Indeed, the photographing of flowers, while not nearly as difficult, may be studied and arranged with almost as much variation as that of the human face. There is surely as much character to flowers as is to be found in faces, and as much taste can be shown in supplying the receptacle for the flowers as can be displayed in the arrangement of a lady's dress or hair. It is very true there is an unlimited range of possibilities in flower photography—such as with the use of orthochromatic plates or filters of various make or color, with which one with long experience in their use may produce the most mystifying results. But those things are not absolute necessities—at least to the degree of success shown in the accompanying illustration.



DAFFODILS. ROY J. SAWYER.



"The sea: The sea: the open sea,
The blue, the fresh, the ever free."

V. SERIN.

A MIGHTY WAVE—HOW IT WAS PHOTOGRAPHED

By WILLIAM FINDLAY

A SOUTH-EASTERLY gale of some severity sprang up on a Sunday. On Monday it increased in intensity, while on Tuesday it was even more fierce. And it rained pitilessly too. Wretched weather it was—too wretched to tempt out the most enthusiastic photographer. Even if he had ventured forth with his paraphernalia, the light was so poor that only lightning plates and lenses of "hextra power," as Sam Weller would say, could have been of any use. One would think that a sea such as was raised by this rushing, mighty wind would be a happy hunting ground for a marine photographer, but what has been said in previous sentences may disillusion the party thinking so.

On Wednesday, the gale still raged, but about noon the army of heavy clouds that had been blown from the sea in close formation showed evidence that the stragglers had been reached, and soon they also passed, allowing the sun to shine without impediment. Now was the photographer's chance. At the seashore a majestic sight met the gaze. Far as the eye could scan, white horses were prancing. Closer inshore was one seething mass of raging water, while among the rocks a ceaseless turmoil raged. The long-continued tumult had churned the water here into froth, which, left by the receding tide, lay in the gullies like driven snow after an exposure to a smoky atmosphere. This was driven inland like thistledown by the comparatively gentle breeze now blowing. Over the point away to the southeast, the breaking waves dashed high, and over the pier in front they thundered majestically. The play of light and shade on them was wonderful and a no more enticing subject could present itself to a photographer.

Two exposures were made from a safe distance, and though they give a good representation of the prevailing atmospheric conditions and refresh the memory regarding the weather at the time, they are commonplace pictures.



"The wild winds lift the ocean in their grasp
And hold it up, and shake it like a fleece."

Illustrating Article "A Mighty Wave—How It Was Photographed," by William Findlay.

I was just on the point of packing up when I noticed that it would be safe to approach much nearer the point where the waves were breaking. Accordingly, I did so. The spray was flying about like a thick mist, and focusing was a matter of some difficulty. However, it was satisfactorily done. The spray was wiped from the lens, which was kept covered till the monster wave that it was decided to snap appeared on the scene. A fraction of a second after it had banged against the pier was allowed ere the exposure (1/100th sec.) was made, and as the picture will show, the mass of water had by that time reached its most exalted state.

The development of the plate required some care. Pyro soda was used, but instead of equal quantities of No. 1 and No. 2 as recommended by the plate-makers, only a small quantity of the latter was poured into the graduate, into which was put 8 drops of a 10 per cent solution of bromide of potassium. The image was some time ere it made its appearance, but no more accelerator was added. Plenty time was allowed for the delicate gradations of light and shade to be brought out. The dish was kept covered, only an occasional look being taken to watch the process of building up. I should say that a stay in the dark room of twenty minutes was necessary to this single negative. I told a friend the same thing lately, and he laughed and said, "Why, I could develop half a dozen in that time." I could do the same thing myself, but if it is thought that something good has been secured, the longer time given is not wasted.

Before closing, I wish to say that on this excursion a valuable brass telescopic stand was ruined. The spray from which the lens had to be protected also settled upon the metal of the stand. When packing up I neglected to wipe the legs before closing them up. About a week after I had occasion to examine my apparatus, this among them. Do what I could, the legs would not be drawn out. I poured benzine into the interior, but still they refused to budge, and in the persuasive process one of them was wrenched from the camera support. The various parts were drawn out by a cycle mechanic with the aid of some chemical, but the stand, as already said, was irretrievably ruined. I mention this to point a moral, not to adorn a tale.



PORTRAIT. RUDOLF DÜHRKOOP.

LANTERN SLIDES

By BURTON H. ALLBEE

AMATEUR photographers do not devote as much attention to lantern slides as they should. What is by far the best possible method of exhibiting one's pictures is sadly neglected. Either they think the process too complicated or they fear the expense of exhibition apparatus. Whichever it is, the influence prevents the development of the most interesting branch of amateur photography.

Almost all amateurs with any pretension to photographic knowledge can make successful prints. The one who can make prints can make slides. The processes are identical. For prints the emulsion is coated on paper. For slides it is coated on glass. The base constitutes the principal difference excepting that the slide emulsion is faster than gas-light paper emulsion, though no faster than bromide. But manipulations can be safely carried on with a gas light turned very low, provided the body is interposed between the light and the slide.

Two ways of making slides are practiced, the contact method, which is merely making a print as you would on paper, and the reduction method, which requires special apparatus or special arrangement of the camera. Not many amateurs will use the latter, so perhaps if a description of practical work by the contact method is given it will serve to show how almost any negative can be utilized.

There are plates and plates. The best one ever made for the amateur was the old Carbutt. Another manufacturer has acquired the formula, but somehow the plates, while yielding clear slides, do not seem to be like those made years ago. Imperial slides are good, perhaps in some ways as good as the amateur can get. But Cramer's and Seed's and many others will make successful slides if properly handled. The individual preference of the one using the plates will be an

important factor, and each one will eventually fix upon some one plate with which he secures best results. When he has reached that stage he will have little difficulty in making good slides from almost any negative that possesses reasonable contrast and snap.

To make contact slides you need a printing frame the size of the negative. If it is 3¼ x 4¼ inches you can get substantially all of it upon the slide. If a 4 x 5 you will have to select the portion you want to reproduce, but usually you



Figure 1.

GLIMPSE OF THE LAKE.
(Contact from 4 x 5 negative.)

can do this without injuring your picture. If a 5 x 7 or larger you will, of course, be obliged to take only a small portion, but generally, even in such a large negative, you will find something you can reproduce on the slide plate that will yield a pleasing picture, at least, though by no means even a half of the negative.

Having clamped your slide plate into your printing frame emulsion down, quite as you make a print, you are ready for

the exposure. The directions which accompany one very good brand of plates state: "The exposure required for a negative of average density will be about five to ten seconds at a distance of twenty-four inches from an ordinary gas burner." The time is right, but the distance is wrong. Lengthen the two feet to six and you will obtain a good slide. Usually five seconds, six feet from a fish-tail burner is sufficient. Sometimes three seconds will do. Not often will ten be required. If, when you look through the negative and it is so dense you can't see the slide plate, from twenty to thirty will be necessary. Five seems to be a reasonably accurate time for the average negative, with ten as an outside limit for dense negatives through which the slide plate can be plainly seen.

Next comes development. Every slide plate has its formula, but two are given here which will be found to give good black tones on most slide plates.

1

Hydrokinone	150 grains
Metabisulphite of potash	10 grains
Bromide of potassium	50 grains
Water	20 ounces

2

Sulphite of soda (dry)	1 ounce
Caustic soda	100 grains
Water	20 ounces

For use take equal parts of Nos. 1 and 2.

After using, always rinse the developed plate well before transferring to the fixing bath. The chief characteristic of hydrokinone is its density-giving quality and the clean, cold tones it yields. No other developer will do this, consequently it is the one which gives the best results.

When using this developer, if the lights in the slide remain white or look white when seen through the developer, you will have a good slide. If they begin to veil take the slide out. It won't be good anyway. Those lights must be white, and remain white, to insure proper gradation of tone.

Here is another formula which gives even blacker and colder tones on most slides:



PORTRAIT. **S. H. Lifshey.**

No. 1

Hydrokinone	60 grains
Sulphite of soda (dry)	1 ounce
Citric acid	10 grains
Bromide of potassium	10 grains
Water	10 ounces

No. 2

Carbonate of soda (dry)	1 ounce
Water	10 ounces

Use equal parts. In practice one-fifth of either of these formulæ will develop a dozen slides without staining or perceptible change. Substantially the same general directions apply to the use of this developer. The only difference is the tones are a shade blacker and colder.

Lantern plates fix very rapidly. How long they should remain in the bath is a question. Ten to fifteen minutes is stated, but five or even three will do. One slide is recalled which was printed, fixed, dried and bound and used in a lecture inside of an hour. That was ten years ago, and it has not changed color a particle since. A dangerous experiment, but necessary in that case.

Plain hypo at about 4 to 1 makes a good fixing bath, but the danger lies in overuse, resulting in stain. An acid fixing bath is better, since it clears and hardens the film, the latter an important consideration. Here is the old Carbutt bath, modified slightly after years of practice. It will work without stain as long as its remains clear. It should be discarded at the first sign of discoloration:

FIXING BATH

Sulphuric acid	1 drachm
Hypo	16 ounces
Sulphite of soda (dry)	1 ounce
Chrome alum	1 ounce
Water	64 ounces

After experimenting with many fixing baths this has invariably yielded the most perfect slides, clear and with a film hard enough to withstand severe usage. It clears very fast, too, which, while it may not be a matter of great importance, at times is useful.

After the slide is fixed and before it goes to the washing box it does no harm to put it through a clearing bath. Not everyone does this, nor is it necessary. Still it often removes a slight veil which may form in the emulsion, leaving the slide perfectly clear.

CLEARING BATH

Water	4 ounces
Pulverized alum	1 ounce



Figure 2.
(Contact from 5 x 7 negative to show architecture of end of house.)

This is stock solution and can be kept indefinitely. When wanted for use take

Water	10 ounces
Stock solution	½ ounce
Sulphuric acid	3 drops

Place in a tray. As soon as your slide is fixed wash it under the tap and place it in the bath, rocking freely. All the slight veil will disappear and the lights will be perfectly clear glass.

Some tone with gold or platinum, but there are different brands of plates which yield different colors by exposure and development, and toning seems hardly necessary in ordinary work.

The slide should be washed an hour in running water. Do not let the water fall directly on the plates. The emulsion is very fine grained and tender and it might be damaged.

Slides are prepared for the lantern by binding a sheet of thin glass next to the film side of the positive, with a mask between them and the whole is fastened together with a strip of binding tape especially prepared, which not only holds the plates firmly together, but excludes the air, which would cause deterioration in some instances. The only room in this process for any personal choice is in the selection of the mask. There are many sizes and shapes of openings, and the one which makes the best composition should be selected. Cover-glass masks and binding tape can be purchased of your dealer.

Here is the whole process of slide making, and it is hoped that amateurs will adopt it more generally than they have heretofore. Two samples are shown herewith by way of illustration (Figures 1 and 2).



WHAT ARE YOU DOING IN MY BASKET? SAMUEL DORAN.

PLATE SPEEDS—FAST vs. SLOW

By HENRY ERLE COOPER

THE present age is one of rush. We abhor the slow and regard speed as a virtue. In this increasing tendency to speed up, photography has not escaped, plates must be fast, and photographers have come unconsciously to regard the more rapid plate as the better one.

The plate makers have catered to the public demand by manufacturing rapid and still more rapid plates. The claims put forward by the makers of these ultra rapid plates are many. Not only are they the fastest plate on the market, but there is an entire absence of grain, freedom from fog, great latitude of exposure, richness of emulsion, etc., etc. So loudly do the plate makers boom the more rapid brands of plates in their endeavor to capture trade that it is well for the photographer to consider carefully whether the advantage of increased speed—and it is undeniably a great advantage—is not obtained, in spite of the plate makers' claims, by a sacrifice of most important qualities.

The quality of the negative is a most important consideration in obtaining a perfect result in the print, and if the negative, owing to incorrect exposure, or an unsuitable plate, is poor, no amount of manipulation, whether during development or after, will ever place it in a first class category.

Reduction, intensification and local treatment are ofttimes necessary and will save a plate from being an absolute failure, but a perfect negative obtained by correct exposure is always to be preferred to one which has been saved by manipulation. It follows, therefore, that the first aim of the photographer must be to obtain his result by correct exposure on a suitable plate.

One of the principal drawbacks to rapid plates is the difficulty of obtaining the exact exposure. This liability to err in exposure when using rapid plates is much greater than



ATALA. E. H. Weston.



when slow plates are used. There are two reasons for this. First, slow plates have a much greater latitude of exposure; second, when using fast plates it is much more difficult to strike the exact exposure required owing to the shortness of the time. Even with the aid of exposure meters one is still liable to err, particularly when the strength of the light is estimated by a chart marked bright light, sunlight, dull, etc. In their endeavor to obtain speed, or the appearance in the plates, plate makers have reduced the amount of emulsion in some cases to the minimum and produced a plate in which it is very difficult to obtain any "body." The rapid emulsions suffer most from not having a wide range of gradation, the scale being very short. On the other hand, the slow plate with its longer scale, if given full exposure, is able to render correctly any gradation from the strongest high light to the darkest shadow.

This superiority of the slow plate was forcibly brought home to me recently when looking through an album of old prints done by various members of a photographic society some thirty years ago when slow plates were universal. Technically they were distinctly superior to the average work of the present day photographer, brilliant in the high lights, rich in the shadows, full of detail and half-tone, and with a marked absence of halation and clogging up of the fine detail. They created unusual admiration in the circle of photographers to whom they were shown.

Of course, for many subjects, such as child photography, indoor portraiture, hand camera work and all rapidly moving subjects, fast plates are essential; but for the majority of subjects met with both by the amateur and professional worker a great advantage will be gained by the use of a plate of a speed not exceeding 175 Hutter & Duffield. Between such a speed and that of some of the brands marked 375 and 400 Hutter & Duffield there is a very considerable difference. It is in the slow plate that there will be found those finer qualities, together with greater ease of working, which go to assist in obtaining first class negatives. The percentage of failures due to incorrect exposure will also be smaller.

In conclusion some of my readers may ask, why trouble about getting absolutely correct exposure when modern print-

ing processes give so much latitude, with ability to adjust the result? I would say in reply that the characteristic feature of photography is its ability to render faultlessly delicate tones and fine detail, to never fail in correct drawing. These are its peculiar and special characteristics, and it lies with its adherents to see that in whatever they may attempt they render results that shall maintain this pre-eminence of photography.



LOVERS' LANE, BRONX PARK. JOSEPH LAURIER.



A GLEAM OF SUNLIGHT. H. E. COOPER.



Figure 1.
ROBIN'S NEST AND EGGS.

BIRD PHOTOGRAPHY

By T. W. KILMER

ONE may get good photographs of birds upon their nests and in their nocturnal haunts if the seeker of these nature pictures has *patience*. This is the one great word which the photographer of this branch of picture-taking *must* learn, and learn well, if he is to succeed in recording anything worth while. This series of six photographs is shown simply to illustrate the method used by the writer in taking bird pictures. The lens should work at a large opening, F/4.5, if possible, and the plates should be rapid. Personally, I use either Seed 27 or Lumiere sigma. The shutter may be of any type so long as it can be operated by a cord or long rubber



Figure 2.

CAMERA READY FOR BIRD PHOTOGRAPHY.



Figure 3.

WATCHING THE NEST.

Illustrating Article "Bird Photography," by T. W. Kilmer.

tube. A bicycle pump makes an excellent "bulb" in cases where the tube is many feet long.

The nest having been located (Figure 1), the camera is fastened in position (Figure 2) and all obstructing twigs and leaves bent or tied back with black thread. If the nest be a low one the camera may be used on a tripod on the ground, but if the object of our picture is situated at some height the camera can be fastened to a tree trunk or limb.

The pictures illustrated here were taken in 1/10 second,



Figure 4.

ROBIN ON NEST. T. W. KILMER.

using a focal plane shutter. A lens hood is always used, as one can take better pictures of *anything* with a hood than without. The operator stations himself at some convenient yet obscure point where a good command of the nest is obtainable (Figure 3), and with the aid of field glasses watches operations. This is where the *patience* comes in. The entire day may be spent in watching and waiting for the psychological moment when the mother bird assumes just the attitude you wish (Figure 4).



Figure 5.

ROBIN AND YOUNG.



Figure 6.

READY TO SHIFT
FOR HIMSELF.

Illustrating Article "Bird Photography," by T. W. Kilmer.

In this particular instance it seemed that the bird took great delight in taking a position upon the nest looking straight into the lens, and it was only by great patience and watchfulness that I obtained her "profile." When her little brood hatched out the camera was again fastened in position, and here we see her (Figure 5) feeding her hungry babies.

Finally her youngsters became large enough to leave their happy home and shift for themselves in birdland, and I wonder what this little fellow (Figure 6) is thinking about after his first flying lesson? There is no branch of photography which tests one's patience and temper more than does bird photography, but the results obtained far outbalance the weary waits and temper trials.



MILLARD. GEO. R. BOSWORTH.



WEIGHING BABY. CLARISSA HOVEY.

MAKING UP DEVELOPERS

By RICHARD TROTTER JEFFCOTT

ABOUT a year ago the question of how best to prepare developers for use in my plant had my serious attention. "System" and "Economy" were combined in the keystone of such a plan, and having the previous year's figures as to cost and consumption before me, the study became interesting.

For some time past I was aware that the gas stove and the gallon kettle were inadequate for my purpose when it came to consideration of our requirements. Glass bottles as containers were another item of expense, inasmuch as they were frequently broken and the contents lost, due to carelessness or accident.

The system decided upon involved a considerable outlay,

and the question of cost in operation and time required to produce a given quantity could not be determined previous to installation. As a factor of operation it was decided upon to figure on the making of 15 gallons of developers at one time, distributed as follows:

Printing room	8 gallons
Dark room	5 gallons
Bromide room	2 gallons

All double strength solutions.

The formulæ which I had tried out and found suited my work to obtain the personal service standard were reduced to a fractional unit, and then multiplied out to produce 128 ounces of developer (double strength). After the standards were set and tested out the various formulæ were written up and posted in the formulæ book.

An interview was then arranged with the representative of the gas company and a study made of the best apparatus to produce water hot enough for our needs. The Lion heater was selected as being the one best suited for the purpose.

From the accompanying cut (Figure 1) the method of installation will be readily seen, the dark room being selected as the most convenient place for its use. Our water pressure was about twenty pounds, and by cutting down the inflow to less than one-half and the arrangement of a manifold just back of the heater sufficient circulation was produced to give us one gallon of hot water every five minutes.

From tests made at various times the following figures will prove interesting: The cost of operating the heater is about three cents per hour; the temperature of water produced in 3 minutes, 142 degrees; in 5 minutes, 185 degrees, and in 11 minutes it reached its highest point of heat, 210 degrees. The cost of installation will be governed by the distance from gas and water terminals—should not be over $25.

After various experiments I hit on the copper measure as being the best idea to retain the hot water produced by the heater, and the self-measuring device shown in the smaller cut (Figure 2) has proven thoroughly accurate and practical. For operation a wooden "bridge" is placed across the porcelain sink and on it a drip or overflow pan of copper 8 inches



Figure 1.

Illustrating Article "Making Up Developers," by Richard Trotter Jeffcott.

square and ¼ inch deep with pipe outlet to catch the overflow from the copper measure. For instance, we are about to make up a quantity of developer. The usual preparations for same have been made and all is ready to proceed with the work. The heater is in operation and the swinging arm is adjusted to the



Figure 2.

measure; the upper or fourth winged set screw is removed from the measure, and in five minutes we have our first gallon of hot water. As the water reaches the fourth opening it overflows and at the speed produced in accordance with the opening, maintains a gallon "level." This same can be also applied to the other three set screws, producing either one, two or three quarts of hot water accurately measured.



THE HAUNTED ROOM. T. LEE SYMS, F.R.P.S.

From the retainer the hot water is poured into the "mixer" and the chemicals meantime measured are mixed in proper order and then poured into a gallon jug (wide mouth) and corked. As all the jugs are of standard size and appearance, I found the best plan of identifying the contents by means of sheet iron tags 1¼ x 3 inches enameled in solid colors and wired to the handles. The code follows:

Printing room, red; dark room, green; bromide room, white.

The plan worked out well and proved economical in cost and operation, for while the heater produced 128 ounces of hot water in five minutes, that amount of time was required to rinse each jug, measure and weigh the chemicals and be ready for the next operation.

Maybe the keynote regarding economy suggests in this connection the purchase of chemicals, for one must remember that each container for chemicals in small quantities, be it carton, can or bottle, adds to its cost. The better plan is to install chemical retainers for sulphites, carbonates, alum, etc., and contract for your requirements for a given period. This, if tried, will show a profit in your favor, even after the expense of large containers is taken into consideration, for it has been well said, "That the leaks of yesterday are the profits of to-day."



A CUPFUL. SAMUEL DORAN.



Figure 1.

LIVE OAKS AND "SPANISH MOSS."

Illustrating Article "Photographing Trees," by J. A. Anderson.

PHOTOGRAPHING TREES

By J. A. ANDERSON

AN artist finds a picture in a lone Arab seated by his camel on the sands of Sahara, but the surface of the earth would be shorn of much of its charm if all were reduced to a treeless desert.

The varieties of pines, spruces and other evergreens, and the large list of deciduous trees with which nearly every section of our country is adorned, offer an almost unlimited study for him who is seeking additions to his collection of tree photographs.

In our Southern States the attention of the tree lover is especially attracted by the live oak, Figure 1, with wide-spreading branches clothed in deep green, while neighboring trees are still in the undress of winter, or by a row of these magnificent trees gracefully draped with the gray "moss" so abundant in the South.

In the same region the impressive long-leaf pine, Figure 2, also affords many opportunities for pictures in its various stages of growth and special features. Very attractive in the spring is the white terminal bud of this species, which is usually quite accessible on the young trees.

There, too, one may come upon an ancient cypress, Figure 3, surrounded by the curious "knees" springing up from the swampy soil, where, glistening beneath the spreading branches, lies the lake by which the tree has flourished for perhaps a hundred years.

In most landscape composition the trees are an essential feature and may there be shown with any degree of softness, according to the effect desired. But in treating them individually as members of any one of the numerous families of trees, sharpness of definition is usually essential, so that the characteristics of the species may be distinctly shown.



Figure 2.

LONGLEAF PINE. TERMINAL BUD.

Illustrating Article "Photographing Trees," by J. A. Anderson.

If practicable the principal view of a tree should include the whole of it, showing as fully as possible the characteristic form and manner of growth, and, whether the picture is of the whole or of a considerable part, the comparative proportions should be indicated by the proximity of some object of familiar size, as a road, a fence, an animal, a person, perhaps the photographer himself, while a friend makes the exposure.

The trunk and its markings and a branch showing forms of foliage may be photographed at short range, and the story of the tree completed by pictures of blossoms, leaf and fruit and any other small details which may be necessary to complete the series.

The smaller subjects are best taken indoors, where posing, lighting and background can be satisfactorily managed, and they should be full size or in some recorded ratio.

A collection of pictures thus representing a member of any species may be made full of interest. In the case of the oak, for instance a study may be made of the progressive growth of the infant tree, starting with the acorn.

As the oak leaves ripen and fall and are dampened by the autumn rains, the dropping acorn finds among them a hiding place where it puts forth a tiny sprout, with nature's intent to reproduce the parent oak. Successive photographs show the progressive growth of the embryo tree, until the sprout has entered the soil and is no longer available. Rootlets may then be grown from an acorn suspended over water in a jar, which, as they progress, may be taken out occasionally for photographing. In due time the downward sprout divides at the point of exit from the acorn and opens the way for one to ascend, which, as the growth proceeds, puts forth leaves which sometimes rival in size those of the mature tree.

In this interesting process is an opportunity to observe the nice adjustment of the growth of the leaf-bearing stem to that of the roots through which its support is derived.

In all the pictures the aim should be to secure pictorial effect, as far as possible, as well as scientific accuracy. The importance of spacing and balance applies here as in other picture work, and some study of the rules of composition is a useful addition to one's natural or acquired taste for artistic posing.



Figure 3.

CYPRESS AND "KNEES."

Illustrating Article "Photographing Trees," by ***J. A. Anderson.***

Some ingenuity may be required in providing means of support for the smaller subjects. Some apples of the wild crab tree, which persisted in dropping from the stem when before the lens, were held in their original position by pins through the cardboard background. Acorns and other seeds may be supported in the same way.

A few buttonwood balls, Figure 4, resisted for an hour the efforts to suspend them in what was deemed a harmonious arrangement, and some of their seeds were only held in the desired position by touches of paste.

Coloring the pictures in nature's tints adds to their artistic and scientific value. For this platinum paper has been found satisfactory, with the water colors of Winsor & Newton, using those which, in their catalogue, are specified as permanent.

The field here touched upon is wide, and he who enters will be led insensibly to the borderland of botanical science, with strong temptation to go farther. He will at least find that even a limited acquaintance with the trees and a serious attempt to put them in picture form will make a marked addition to the pleasure which every photographer feels in viewing the face of nature on the ground glass, whatever may be his disappointment at the limitations of his art in adequately portraying what he sees.

In any event the pursuit tends to open the eyes to much of one's surroundings which otherwise might not be observed, and to increase one's knowledge and love of the beauties with which a bountiful nature has surrounded us.



Figure 4.

BUTTONWOOD BALLS.

Illustrating Article "Photographing Trees," by J. A. Anderson.

NOTES ON NIGHT PHOTOGRAPHY

By ARTHUR HAMMOND

AVERY interesting branch of photographic work is night photography, and it is one that should appeal strongly to many workers. It offers alluring problems to the enthusiastic technician, and the difficulties of halation, over-exposure of the high lights, will awaken his keenest interest. Furthermore, the artist can revel to his heart's content in the pictorial possibilities of night pictures, which may be every bit as satisfying to the artistic sense as any taken by daylight, for we have got far beyond the garish records of illuminations which used to be regarded as curiosities, and our night pictures now may rightly be classed as pictures instead of being regarded merely as exhibitions of technical dexterity.

There is a wealth of material at hand, both in the city and in the country, ready for the seeing eye, and there is a wonderful charm in the representation of broad, dark masses of shadow, relieved by an occasional accent of light.

The photographer who is interested mainly in the science and the technical difficulties of his medium will show this in his choice of subjects for his night pictures. He will not seek to evade difficulties; he will not endeavor to cover up the lights in his picture with a convenient tree or a telegraph post, but will glory in rendering as many lamps as possible with the minimum of halation and other technical faults.

But the artist who is aiming to secure a picture and who regards technique merely as a means to an end will seek to portray the effect of light rather than the light itself, and shadows will be given as much consideration as light.

The artist will include as few lamps as possible in his picture, for many lamps tend to make it "spotty" and confusing, and the placing of these lamps in the picture space will be carefully considered. A little halation, too, will not be regarded as a grievous fault, for on a misty night such an effect is seen in nature; each lamp has a little halo around it.



Figure 1.

THE BRIDGE. ARTHUR HAMMOND.

It must not be concluded from the foregoing paragraph that technique can be ignored or slighted just because artistic results are aimed at. Technique comes first, and until it has been mastered and until the worker has complete control over his medium, he is not in a position to carry out any artistic ideas he may have.

A painter has to study technique; he has to spend much time in learning how to use his pencils and brushes before he can paint a picture; and, similarly, an artist who uses a camera instead of paints and brushes, has to master the

technique of his craft before he can control it sufficiently to enable him to secure the effect he wants.

There are many photographers, however, who are so interested in the technical and scientific problems that are encountered in the use of a camera that they regard technique as the be-all and end-all instead of merely the means to an end, and they look at a picture always with an eye to its technical qualities. They regard it as a *tour de force* in technique rather than as the expression of a theme. If the definition is not critically sharp, if a lamp shows a little halation or if there be any other so-called technical errors, the picture is instantly condemned; whereas, if the picture is by a worker who has mastered his technique and can control his medium (and no photographer can hope to produce consistently good work unless his ideas are based on a firm foundation of practical technical knowledge and experience), such so-called errors are not accidental but are intentional.

In night photography there is a good deal of technical skill necessary, but it is not in any way different from the skill required for daylight work, and a photographer who has mastered the rudimentary principles of exposure and development so that he can be reasonably certain of his results need have no hesitation about undertaking night photography with every possibility of success.

As in all photography, correct exposure of the plate is the main factor, but the "latitude" of the plate gives us a margin of safety, and in night photography, where the exposure is reckoned in fractions of an hour instead of fractions of a second, the "latitude" in exposing is very much greater. The exposure for a night picture may be anything from a few seconds to half an hour or more. The nature of the subject, the atmospheric conditions, the speed of the plate and of the lens are all variable factors to be considered. The subject varies, of course, as to its brightness and as to the number and kind of lamps with which it is illuminated.

Rain or snow will usually cut down the exposure about one-half because so much light is reflected into the shadows. The speed of the plate and of the lens vary just as in daylight work; each successive smaller stop in the lens doubles the exposure.



Figure 2.

THE CHURCH DOOR.

Illustrating Article "Notes On Night Photography," by Arthur Hammond.

A very rapid lens—one working, say, at F/4.5—can rarely be used except for subjects that are practically all in one plane, for one can rarely have the distant planes slightly out of focus as is permissible in daylight work, because any lamps appearing in these distant planes must be reasonably sharp or the halation will be very marked. An out-of-focus lamp will be rendered as a very ugly blot of light. For this reason a stop of F/8, or sometimes F/11, is generally needed.

Then, again, unless the subject be exceptionally bright and well illuminated it is hard to be quite certain of the focusing on the ground-glass screen, and a medium stop with its greater depth of focus will give less chance for errors.

A scale for focusing will be found to be more satisfactory than a ground-glass screen on account of the difficulty of seeing anything except the lights to focus on, and there is no reason, therefore, why a folding hand camera without a focusing screen should not be used very successfully for such pictures.

As a matter of fact, practically any camera is suitable for night photography, and practically any lens. The proud possessor of a high-class anastigmat is no better off than the owner of a humble rapid rectilinear. The simpler the lens the less likely is it to give "ghosts" or flare when used on such trying subjects. Single meniscus lenses such as are fitted to the cheaper forms of hand cameras are quite suitable for such work and will give very satisfactory results.

Lenses of the soft-focus type may be used with good results, though such lenses would generally need to be stopped down to F/8 or smaller if there are any lamps in the field of view, because the spherical aberration in the lens would give too much halation around the lamps.

When the lamps are excluded and only the effect of the lamps is seen such lenses can be used at a wider aperture.

With regard to the most suitable plates for night photography there is a wide diversity of opinion.

There is no one best plate; any anti-halo (backed or double coated) plate will do, and films are very satisfactory. The new "Hydra" plates ought, in theory, to be particularly suitable, but I have not yet tried them.

The chief difficulty that is liable to be encountered in night



Figure 3.
THE GARDEN AT MIDNIGHT.
Illustrating Article "Notes On Night Photography," by Arthur Hammond.

photography lies in the unevenness of the exposure, parts of the subject being very much overexposed, while parts again have had only barely sufficient time. In nearly every subject there is a tremendously long scale of tones, ranging from bright and very actinic arc lamps, which need only a few seconds' exposure, to dark shadows, which require several minutes. The problem is to keep these two extremes within the range of the printing process that is to be employed.

The only way to secure detail in the shadows (and a little detail in all but the darkest shadows is generally desirable) is to give enough time for the faint image to make an impression on the sensitive emulsion, but in so doing the high lights will be, inevitably, much overexposed—sometimes even to the point where complete reversal takes place. Halation of the high lights naturally occurs by reason of this overexposure, and many schemes have been suggested and tried out to overcome this excessive halation. An English worker, the founder of the Night Photographers' Society of London, had some plates specially made, coated on green glass. This prevented halation to a great extent, but the negatives were difficult to print from.

Except in very extreme cases a double-coated plate will generally look after this halation pretty well if it is developed carefully.

The old rule, "expose for the shadows and develop for the high lights," holds good in night work. Sufficient exposure must be given to secure as much shadow detail as is desired, and, in developing, the high lights must be watched carefully and must not be allowed to become too dense.

A night negative is so different in appearance from the usual kind that it is apt, at first, to be misleading. The subject consists mainly of shadows as a rule and the high lights occupy only a very small space. In outdoor subjects the sky will be dark, sometimes quite black, and this alone is apt to be puzzling to the inexperienced night worker who has been accustomed to seeing the sky appear very early in development.

The small and apparently insignificant high lights are what must be watched in developing, and they must not be allowed to become too dense. The resulting negative will be very thin



DOROTHY. BESSIE W. THOMAS.

and transparent; parts of it will be, probably, bare glass, and this is quite as it should be, for a night picture consists mainly of shadows with very little visible detail. The whole negative should be kept thin and flat—even the high lights—or it will be impossible to obtain a good print from it.

The most common fault of the beginner is to carry on development too far, which results in fogged shadows and dense, unprintable high lights.

Development in a tank is a very satisfactory method. I have developed many night pictures in this manner, with the developer so diluted that the time of development was about three hours, but I have lately adopted another method which is quicker and which seems to be equally satisfactory. I use a large tray which will hold six 5 x 7 plates or eight 4 x 5, so that I can develop all my exposed plates at once, and I start development with an edinol-hydro solution diluted to about one-quarter normal strength. As soon as an image begins to appear I pour off this developer and—without rinsing the plates—pour on some plain water so that they are well covered, and let them soak, without rocking, for about fifteen or twenty minutes.

By that time a good deal of shadow detail will have been brought out, but the high lights will not have become too dense.

The theory of this method seems to me to be as follows: The film absorbs a certain amount of the weak developer which remains in the film when the water is poured on. Where the high lights are this developer is soon used up and development stops just in those portions, but in the shadows the developer is still fresh and active, and those parts continue to develop while the plates are lying in the water. If the tray were rocked all the time the water would wash the developer out of the film and it would act uniformly all over the plate, but by leaving the plates alone and letting them soak in the water the developer in the film can act selectively.

With regard to the exposures for night pictures, this is a matter that can be settled only by experience.

It is quite possible to overexpose night pictures, and this is quite a common fault at first. By giving too much exposure too much detail is secured, and the result is more like day than night. The aim should be to secure in the negative only as much detail as can be perceived by the eye, and no more. By this means the true night effect will be secured.

It is necessary to study the subject carefully, to note how much detail can be seen in the shadows after the eyes have become accustomed to the dim light. There may be shadows so dense and black that no detail is visible, and these should be rendered in the picture as dense and black; but where detail



Figure 4.

WASHINGTON STATUE.

Illustrating Article "Notes On Night Photography," by Arthur Hammond.

can be seen it should be represented in the picture. The exposure must be gauged, therefore, to give just sufficient detail, but not too much. It is impossible to give any definite rules as to exposure. Subjects are so varied, and different developers and methods of developing all affect the result. The data concerning the pictures here reproduced will give some idea as to the exposures required, and will serve as a basis for experiment along these lines.

Figure 1—The Bridge. Twenty minutes at F/6.3. Imperial "Special" rapid plate, 4 x 5. Goerz lens.

Figure 2—The Church Door. Six minutes at F/4. Wollensak "Verito" lens. Cramer double-coated "Inst. Iso" plate, 8 x 10. Subject practically in one plane.

Figure 3—The Garden by Night. Twenty minutes at F/11. Cramer double-coated "Inst. Iso" plate, 8 x 10. Wollensak "Verito" lens.

Figure 4—Washington Statue, Public Garden, Boston. Six minutes at F/8. Cramer double-coated "Inst. Iso" plate, 4¾ x 6½. Spencer "Port-Land" lens.

It will be seen from this data that long exposures of twenty minutes or more are sometimes necessary, and it will be found that when giving such exposure people passing to and fro in the field of view will not matter at all. They will not show in the negative unless they keep still for several minutes, but any vehicles carrying lights must be carefully guarded against because a moving light, even if traveling quickly, will show as a streak across the picture. When working in the streets or in any place where such lights are liable to be present it is necessary to watch carefully all the time and cover the lens every time such a light passes across the picture.

Figure 1 (The Bridge) required very careful watching, for though it was taken at an hour when traffic was comparatively quiet, there were many taxicabs, autos and motor "omnibuses" passing over the bridge.

It is not advisable to close the shutter every time; in fact, this would be apt to jar the camera. All that need be done is to hold something up in front of the lens; a piece of black card or the slide of the plate holder.

While doing this it is difficult to watch the time as well as the traffic, and a convenient way to measure short exposures



CHILD PORTRAIT. **Goodlander Sisters.**

of two or three minutes quite accurately enough is to count from 1 to 60 fairly slowly for each minute. (A little practice with a watch will give a good enough idea of the right speed.) Stop counting while the lens is covered and continue as soon as it is open. For longer exposures a good way is to get your pipe going, if you are a smoker, and measure the exposure by the number of times you have to refill it. My pipe takes about a quarter of an hour to burn through.

The winter time is a very good time for making night pictures, especially on a clear, frosty night when the ground is covered with snow, but it is very cold work and many people would prefer to wait till the spring before undertaking such work.



SEED OF COMMON GARDEN WEED. F. A. TINKER.

WINTER WORK

By CHARLES STILLMAN TAYLOR

MANY amateurs seem to cling persistently to the opinion that Winter with its accompanying snow, leafless trees and heavy frosts is not a very favorable season for photography. This error is the outcome of inexperience and a lack of inclination to observe, study and to admire Nature in any but her gayest and most brilliantly colored moods. To many minds the mention of Winter work pictures masses of piled-up snow, ice-bedecked trees and frost, frost, frost!

But while the greatest charm of Winter undoubtedly lies in the snow and ice, this is by no means all of Winter photography. The leafless trees standing tall and bare, the icy bound brook, the country road with its partly broken wagon ruts, all make attractive subjects and with proper arrangement within the picture space are capable of making countless photographs that are well worth the doing.

What observer of the great outdoors is not attracted by the rugged appearance of a wintry landscape, where the eye is held, not by a mass of brilliant colors but by sheer force of the simplicity of the season? This direct appeal to our love of form and light and shade is the foremost fascination of Winter work, and in its delightful freedom from detail we have the keynote of its real pictorial worth. At this time of the year, when the Summer's panorama of color is absent, we see outdoor subjects more nearly approaching the monochrome and we view a landscape with more of the mechanical vision possessed by the lens. This is the reason why we see so comparatively few hopeless failures taken by amateurs of tender age.

The lack of color values is a great help in teaching the photographer how to compose available material, as that distracting element—color—is not present to share our attention and we give more thought and care to the foundation of our landscape, namely, composition.



SYDNEY ALLAN
(SADAKICHI HARTMANN).

WILLIAM SHEWELL ELLIS.

So all ye unbelievers get out your cameras and look up the pictorial possibilities of the cold months, and when Summer comes to greet us you will have gained a better knowledge of expression and can better appreciate and portray the more complex Summer landscape.

In the writings of many photographers the authors have deemed it advisable to go into more or less detail concerning the apparatus employed. This subject of cameras and so on is a much rehearsed one, and I will confess that I am a little out of patience with what seems to me an undue prominence given to the technical side of our art.

Directions for successfully manipulating the camera are perhaps necessary for the beginner, but to the majority of amateurs who have a clear working idea of lenses and apparatus in general the omission of all ordinary mechanical directions is as it should be. Photography is necessarily a medium of mechanical delineation as far as apparatus is concerned, and to lay continual stress upon the technical side is to sacrifice the real mission of any art.

A practical knowledge of using our picture producing materials is of course required if we desire to express our own personal and artistic feeling, but this is no reason why—even in pictorial writings—we should be slaves of a machine. Unlike the photographer, the artist is not forever harping upon the tools of his craft; he occupies his time in a far better way, and while the artist appreciates the value of the best technique, he only regards it as a means to an end, and that end—a picture.

In the days of Winter the air is more or less charged with fog and frost, and the picture making possibilities of this atmosphere are by far the most valuable quality we can obtain. Among the several hundred photographs which annually come to my table for criticism—I am speaking of Winter views exclusively—almost all make the mistake of keeping the sky too light in tone. This fault upsets the tonal quality of the photograph and a proper balance between the sky and the high lights is destroyed.

Another often repeated error is in the foreground, where often several dark objects loom up in a very disagreeable and inartistic manner. Endeavor to have a well balanced view



UPLAND SUNSHINE. **Dr. Malcolm Dean Miller.**

(Wollensak Verito lens F/5.6., 2 sec. exposure, Def. D. C. ortho. plate, with Cramer 1os. filter II.)



throughout, avoiding excessive contrasts and rather aiming to secure in your work the peculiar delicacy of grayish softness which our eyes tell us is seldom found in any but Winter and early Spring landscapes. This slight veiling of Nature is a great aid to the camerist, toning down the background into a misty indistinctness that is rather suggested than seen.

It is this appeal to our imaginative minds that holds our interest for all time. A photograph or picture that appeals to the eye alone is of but little interest and is soon laid aside, explaining in a few words why the usual photograph with clear, sharp detail is hardly given more than a passing glance of curiosity.

There is some little difficulty in the correct judgment of this mist, and the quality as well as the quantity has its peculiar effect upon the plate. Usually more fog or mist is shown in the print than we believe exists at the moment of exposure. This is because of the wide difference in the lens and our own vision. By partly closing the eyes we can more nearly see the effect as the lens will reproduce it. Try the experiment yourself and as you close the lids you will find the effect of quantity to increase and as you gradually open them the mist appears to decrease in quite a marked degree.

The quality of the mist is often of two kinds, sometimes of a yellow and again of a white grayish color. The yellow or brownish tinge is quite likely due to minute particles of dust and smoke and is found only in the vicinity of manufacturing cities and towns. In a photograph the yellow fog usually prints out in a very disappointing way, giving but a poor suggestion of the vague mystery we admired at the time.

I have repeatedly noticed this peculiarity when photographing in the immediate neighborhood of factories and rolling mills, and the difference in the atmosphere as seen by the eye and that depicted by the lens has been so greatly increased in the print that the entire character of the view was undesirably changed. When this yellowish fog is present it is seldom desirable to expose many plates, as the print will unquestionably show an opaque veiling of the atmosphere, which degrades the picture tones and gives a muddy and unnatural effect.

Striking varieties of subjects which are rendered in a particularly charming manner by a misty, hazy background are

the views taken by the banks of rivers, lakes and streams, and in the larger towns and cities the docks, with their numerous boats and shipping, offer promising material.

Even the ugly modern outline of the factory and warehouse is subdued in a very noticeable manner, and these monuments erected by the industry of man form excellent backgrounds for a bit of dilapidated wharf or a fishing boat lying at her mooring.

But it is in the country that the most pleasing material is abundantly found, and in the leafless trees we find splendid material. In the arrangement of these grim sentinels care should be taken to bring out the individual character of each species. You will find that everything in Nature has an individuality or characteristic peculiarity its own, and a beech, oak or any other tree can be as adequately expressed by its form and light and shade as well as by its foliage of varying hues.

The mode of dealing with trees is somewhat different in Winter than when in bloom or leaf. It is by all means necessary to treat the entire composition in as simple a manner as possible, taking particular care not to include too much within the view. The usual mistake with amateurs and the principal reason for many failures is in overcrowding the view.

This cutting out of an overabundance of material is one of the hardest problems in photographic composition and may be regarded as the rock upon which many a picture has gone to ruin. Look your chosen subject over carefully and from every possible point of view, for it often happens that a distance of four or five feet to this or that side will change the composition very materially.

Have one center of interest, one principal object for your composition and keep everything else subordinated. In a pleasing picture there are never two objects with just the same prominence; one must be more striking than the other. If this rule is violated we have two or more objects of nearly the same importance, each opposing the other; or, expressed in another way, we have variety without unity. The complex or elaborate composition is seldom a desirable arrangement for a photograph, and where there is one successful portrayal of this type there are many hundred failures. The simplest



REV. E. G. WATTS.

subjects possess the greatest charm and are, of course, much easier for the photographer to manage.

What has been said about arrangement of forms applies with equal force to the arrangement of light and shade. There should never be two high lights with the same brilliancy or two shadows with the same degree of darkness. It is oftentimes desirable to repeat the tone of a tree trunk with a bit of decayed branch or log in the foreground, or to echo the light on the water with the lesser reflection of a bright pebble or projecting stone. In this echo of the principal light or shadow we have a very powerful aid in giving the proper balance to a view, but great care is necessary to keep this repetition well within bounds.

The echo of repetition must not be repeated with the same intensity or force, but like the background it must be subordinated that its power will help to accentuate the beauty of the principal object and not create a feeling of opposition or rivalry. The question of clouds and skies has been long discussed in the magazines and the general opinion seems to be that "anything but white paper is acceptable." This standpoint is nothing short of carelessness and it is foolish to suppose that any or every sky is suitable for all negatives.

The advice (?) which has been so often given about photographing a batch of sky negatives and keeping an assortment on hand to use in combination with landscapes is certainly a funny bit of wisdom. A sky of some kind may be deemed indispensable for an outdoor view, but a satisfactory sky can hardly be made up beforehand, and, strange to say, it is seldom possible to get the two upon the same plate at one exposure, or at least I have not had the good fortune to find it so.

In the days of Winter we often have a gray sky, and in the photographs of snow and ice this sky fits in very nicely. The heavy masses of cumulous clouds are sometimes to be seen at this season of the year, but these light, brilliant forms belong to the warm months and rarely look well with a wintry landscape. The long streaks of clouds known as "mare's tails," which foretell more or less wind, in their ragged, wind-blown shapes, seem particularly fitting to express the rough aspect of Winter.

But after all, the proper sky to print in is greatly a matter



WORK HORSES. CHAS. VANDERVELDE.

of taste as to the impression you desire or wish to give to the picture, and, providing we use due care in selection and do not print it upside down, or use a sky illuminated from a contrary direction, we will do the trick in a pleasing manner.

The selection of a suitable sky tint to be used in combination printing should demand considerable care, because a carelessly put together photograph will show the evidence of the means employed, which of course defeats the aim of our work. A number of things enter into the question of selection and an observer of these points will perhaps assist the inexperienced

to avoid those glaring faults and absurd incongruities so often seen in the collection of the novice.

The first consideration is in the selection of the point of view, or the direction from which the clouds or sky are illuminated. In case a landscape or other view is lighted from the east or west, it is evident that the sky or clouds must be lighted from the same point, or at least have the appearance of being so lighted. Remember that the time of day and the point of view are solely given to help the novice to learn the ins and outs of selection, and it is not intended that he will adhere rigidly to this or any other fixed mode of procedure.

Perhaps you may have noticed this exception: supposing the sun is in the east and the sky in this quarter is heavy with clouds, while in the west the sky is clear. It is obvious to all that the sun cannot light the landscape from the east, because of the thick veil of clouds, and the light must come from the west. Here we have a common enough occurrence and from the south and north as well as the east.

I am aware that this is exactly the contrary to the advice given by many writers, who lay down an inflexible rule that the photographer must adhere to the formula "always photograph the sky and landscape from the same direction and at the same time of day." But I am sure you can see the folly of this advice from the foregoing and the single instance above given will show you that a strict following of any fixed rule cannot be lived up to.

It has been often said that to copy Nature is to secure a natural expression, and while this assertion is true in part it is productive of greater harm than good if carried to the silly extreme many so-called "purists" have devoteed.

Oftentimes we see sun-lighted clouds printed into a landscape of a dull tone, and I remember looking at such an unbalanced view in one of our important exhibitions. The subject was an excellent one, a flock of sheep quietly grazing upon the meadow. The treatment of the subject was nicely done and it was evident that a great deal of care had been taken by the photographer in arranging the composition. But the sky, ah! that was a most unaccountable blunder, and it hardly appeared possible that the same hand that produced the artistic landscape could have possibly gone so far astray in selecting the sky.



WATER LILIES. L. F. BREHMER.

The subject called for a bright and cheerful Summer sky with clouds as light as a bit of thistle down. The opposite was chosen, however, and an ideal study of peace and quiet was totally destroyed by the heavy masses of ragged cloud we often see in the wind-blown sky during or shortly after an October gale. Another mistake is commonly practiced, and this is in overprinting the sky forms, making an opaque effect, wherein all the vapory, airy lightness we associate with the beauty of the sky is lost.

In the development of negatives desired for combination printing, the action of the developer should be stopped as soon as the clouds have attained a little density. This transparent negative is easily arranged over the landscape portion of the print and by reason of its clearness the trouble of registering the two accurately is almost entirely overcome. A sky may be regarded as "fit" when it seems to suit or agree with a landscape, and it is a matter of no importance whether the conditions of exposure were absolutely correct to Nature or not.

If you are photographing the sky solely for its meteorological value, or to secure unusual arrangements of light and shade, you will do well to copy natural conditions, but if you desire picture producing material select the sky with care that it may embellish the landscape.



PANSIES. CHAS. M. SMYTH.



A WHITE MOUNTAIN TROUT STREAM. C. M. Shipman.





LUMPS OF POLLEN GRAINS ON THE LEGS OF HONEY BEES. EDWARD F. BIGELOW.

(Photographed With 3 Inch Celor—Acetylene Illumination.)

PHOTOGRAPHING HONEY BEES

By EDWARD F. BIGELOW

FOR the greater part of nature photography I am an advocate of long focus lenses wherever they may be used, but have difficulty in convincing some of my friends that half a lens, of the divisible kind, is better than the whole by reason of the greater perspective and greater depth of focus, contrary to the unqualified statement of the photographic catalogues that short focus gives greater depth than long focus. It does and it does not.

In photographing honey bees the long focus not only gives greater perspective and additional safety, but I feel sure that many of my photographic friends will carry the argument to the extreme and say that they prefer a telephoto for such work!

I have always found the 16½-inch front section of a Protar No. 9 advantageous for this kind of work. A telephoto would be useful in many cases when the swarming bees attach themselves to a high branch, but the telephoto would lack speed and would not give the necessary detail to the individual bees of a cluster on a high and swaying limb. You, of course, recall the classic advice of a fond mother of ye olden times who told her son when he complained that his sword was not long enough that he should add a step to the sword.

That advice applies photographically to the clustering honey bees. The better method is to add several rungs to the ladder and to get a saw to assist in focusing the lens. If the bees are suspended more than ten feet from the ground get a strong ladder that will reach not only to the bees but far above, because it is usually impossible to obtain a firm support for the ladder without getting inside of the tips of the branches. The better way is to have the combined ends of long branches support the ladder. One is then left far out toward the edge of the tree.

Bees at swarming time can sting, and often do sting, with extreme vindictiveness, contrary to the newspaper statement that they may be safely handled at such a time. Such newspaper assertions have a grain of truth, but only on general principles. Bees when swarming are much milder in temperament than at certain other times, but are probably no more willing to pose before the camera than they are on those days when the nectar is coming regularly and rapidly from the fields.

Having sawed the limb, drop the saw to the ground, take a firm hold of the limb and take it to the ground. It would not be possible to nail this branch to any perpendicular support because the hammer would jar off every bee. Have in readiness some ordinary metal clamps, such as may be obtained at any hardware store for a few cents, and by them clamp the branch to an upright support. One may then focus at leisure, preferably using a focusing glass to get every detail of the markings on the body of the bee, as well as sharply to define their wings and other parts. The focusing must be done largely in one plane.

Not much dependence can be had upon stopping down the



Figure 1.

A Remarkable Photograph. Examine with a Pocket Microscope. Note the Sharp Detail in the Frame at the Left and at the Bottom, Resting on the Box.

Illustrating Article "Photographing Honey Bees," by Edward F. Bigelow.

lens for great range of depth, because the exposure cannot be slower than 1/25 of a second, and it must be remembered that when the bees are first taken from a tree they are in rapid motion. The individuals of the entire mass are vibrating rapidly and the two essentials are depth by long focus and speed by open lens. This use of long focus is advantageous in photographing the worker and his bees.

There must be speed to photographically "stop" the motion of the bees running rapidly over the comb, and there must be sharp detail to show each cell within the comb, as is well exemplified in the lower frame that stands cornerwise on the box in the accompanying illustration (Figure 1). This I regard as an exceptionally good piece of honey bee photography. Apply a lens, a pocket microscope or a focusing glass to the half-tone cut and you will see that every detail of the bees, as well as of each individual cell, is perfect, though the bees are running rapidly over the comb in every direction.

Here a focal plane shutter is useful, but not necessary, if the lens is a good one and there is plenty of strong light. In the upper left-hand corner of the illustration the frame held in the right hand of the bee-keeper is a marked example of good definition of each individual bee as well as of each individual cap of the brood. The term brood is applied by the bee-keeper to the cap over the pupæ. The cappings of these cells show clearly in the lower right-hand corner of that upper left-hand frame.

The photographer of honey bees and of their manipulators must not only be a perfect master of his lens, but he must be master of the art of dealing with people. He must be perfectly calm to inspire calmness in those who are manipulating the bees. No one better than the experienced photographer of honey bees knows the danger to those who are handling them, but he must withhold all such knowledge, and, by his apparent fearlessness, convey the impression that there is little or no risk.

This is practically not difficult with the experienced apiologist, but becomes hazardous with the person who has had no experience with honey bees. In the accompanying illustration (Figure 2) of a veteran bee-keeper with a workman at his left (the right in the illustration) the workman has had not



Figure 2.

The Veteran Bee-Keeper Is Giving the Workman His First Lesson in Handling Bees. Note that the Hive Is Literally Overflowing with Bees. (Photographed with Zeiss Protar No. 9.)

Illustrating Article "Photographing Honey Bees," by Edward F. Bigelow.

more than one-half hour's experience with bees. He was engaged to bring some hives and boxes for the convenience of the apiarist. Several bees got after him and he ran frantically across the fields for some half a mile vigorously working arms and legs like an animated jumping jack. Slowly and hesitatingly he ventured back to within some forty rods of the apiary, and by a fair amount of urging and encouragement was then induced to come up to the line of hives and take his first lesson. The great difficulty in such photography is to get the subjects to banish all appearance of self-consciousness. Encourage them in every possible way, talk a good deal about bravery and work in a funny story or two. The secret is to have the people who are handling the bees forget what they are doing and the risk, and, paradoxical as it may seem, if they really forget the danger there is no danger.

In photographing the details of honey bees and their work the most difficult thing I have ever attempted to do is to portray clearly the eggs of the queen bee at the bottom of the cell. For this purpose use a short focus lens, preferably one of not more than three inches, and a long focus camera. Use a bellows length of some four feet. Of course, with such short focus lens it is not possible to bring into the same plane the top and the bottom of the cell at the same time. So for extremely sharp definition I find it convenient to take a razor and carefully slice off all the comb that is above the top of the egg. The eggs are curved and are usually placed in the bottom of the cell with a little slant to them, which lessens the difficulty. It would be impossible to show more than the white speck of the end of the egg if the eggs were placed perpendicular to the cells of the comb.

By using a focus of medium length, say of about nine inches, it is possible to get the requisite magnification by an extremely long bellows, but even with so long a focused lens it will be better to stop down pretty well. The accompanying illustration (Figure 3) shows the best photograph of the kind that I have ever seen. If some one can show a better I shall be glad to examine it.

Perhaps the most difficult test of color value is to differentiate the white larvæ from the surrounding white, royal jelly or "pap" in which they float. Here there must be extremely



THINGS ONE LOVES SHOULD BE HUGGED!

Illustrating Article "Photographing Honey Bees," by Edward F. Bigelow.

sharp definition and the exposure must be exactly right. This can be ascertained only by frequent trials. If the exposure is not enough or a little too much there is a white confused mass at the bottom of the cell, but by getting the exposure right the larvæ may be seen in their surroundings and even the tracheæ within these semi-transparent bodies may be defined with a fair amount of sharpness. The details of honey bees are shown to the greatest advantage by the photo-micrographic camera.

Perhaps the best that I have been able to secure are the legs of the bees and the pollen masses on them, with a reasonably sharp definition of the hairs at the side of the legs that, like the stakes on a hay wagon, hold the load in place. For this purpose I have used with advantage the short focus Celor lens made by the C. P. Goerz American Optical Company.

Success in photographing honey bees induces the photographer to love them better and better and leads him on to the enchanting realm of photography of other insects—but this is another question that I reserve for some future time.



Figure 3.

QUEEN BEE EGGS IN SITU AT BOTTOMS OF CELLS OF HONEYCOMB. EDWARD F. BIGELOW.

(Photographed With 3 Inch Celor.)



PORTRAIT. William Gill.





Edward F. Bigelow, in the Foreground, Giving Boys Their First Lesson in Handling Bees, and Incidentally Showing How to Take a Good Grouping of Bee Workers.

Illustrating Article "Photographing Honey Bees," by Edward F. Bigelow.



PELICANS AT DINNER TIME. WALTER L. BEASLEY.
(Taken With Ross Telecentric Lens, 17-Inch Focus, F/6.8.)

WILD ANIMAL PHOTOGRAPHY

By WALTER L. BEASLEY

OUTSIDE of an actual journey to the remote game region of America, Africa and other places, the best spot to pursue the fascinating and thrilling art of wild animal photography is unquestionably to be found in New York's great Zoological Park. Here within its spacious land area covering two hundred and sixty-four acres, two-thirds in virgin forest growth, has been gathered together from all the corners of the earth the largest and rarest collection of living animals to be seen in captivity.

One of the crowning features of this fine animal sanctuary is the open-air ranges, pastures, extensive corrals, enclosures, etc., many with the picturesque and rugged backgrounds of high rocky summits, green foliage, etc., which provide a splendid home for the animal inhabitants—a slice of Nature's



LANDSCAPE. JOHN CHISLETT.

domain. These large open-air preserves afford most favorable opportunities for obtaining wild animal photographs.

The writer, through the courtesy of Professor Henry Fairfield Osborn, president of the New York Zoological Society, and Director W. T. Hornaday, was accorded the highly esteemed privilege of making a series of pictures of many of the large and rare forest and jungle creatures. I found that a few of the essentials necessary for success in animal photography, in captivity at least, was patience, good temper, a little nerve, a reflecting camera with focal-plane shutter and, preferably, a rapid, long-distance lens.

The accompanying photographs here reproduced I obtained the past Summer with the new Ross "Telecentric" Lens, seventeen-inch focus, F/6.8, with eight-inch bellows extension on a 5 x 7 reflecting camera. This new instrument I found to be of decided advantage from a point of personal safety while making exposures of savage and bad-tempered animals. At twenty-five feet or more one could obtain sharp and large sized images without venturing within dangerous range such as a nine or ten-inch lens would require. "Don't get too near" has been a most familiar warning which I have heard from the keepers many times in the past in attempting to get too close to an animal for a large picture while taking a daring chance inside a den enclosure.

Among the "stars" of the park, and one of the largest of all living carnivorous beasts in captivity, is "Ivan," the mighty Alaskan brown bear, one of the animal wonders of the world. A sudden outburst of rage and spring of this wiry monster, if one was operating inside the den at close range, would mean partial annihilation of both man and camera. With the long focus "Telecentric" I found I could easily operate through the bars on the outside and secure the proper size image. Owing to his gigantic size, and being likewise a magnificent representative of the species, Ursus Merriami, unfortunately nearing extinction, "Ivan" is of great zoological value to naturalists as well as to the general public—being the unrivalled attraction at the Bear dens. I desired to catch a few realistic pictures of this colossus of the Alaskan wilds, especially in the novel and commanding attitude of standing on his hind limbs. To entice him to pose I had to resort to the fol-



IVAN—THE GREAT ALASKAN BROWN BEAR.
(Taken With Ross Telecentric Lens, 17-Inch Focus, F/6.8.)
Illustrating Article "Wild Animal Photography," by Walter L. Beasley.

lowing tactics. On Mondays, after "Ivan's" fast of Sunday from his customary rations of twelve to fifteen loaves of graham-rye bread and several pounds of fresh fish or beef, he is quite eager to welcome the appearance of his keeper and chef. To coax the big fellow to stand upright the keeper used a half dozen good-sized fish. Twenty-five feet in the rear of his den the huge bear was watching our approach to the front bars of the den. A fish was at once thrown and eagerly devoured. This was preliminary and just to put us on a friendly footing. Having camera ready and in focus, "Up, up, Ivan," rang out the familiar voice of the keeper. Then the herculean form, possessing the phenomenal strength of three African lions, towered up nearly ten feet in the air, presenting a thrilling and almost overwhelming picture of power and ferocity.

The great monster stood, seemingly at bay, a stupendous avalanche of savage flesh, an unconquerable warrior of the forest, the massive forearms, terrible battering-rams of death, ready to give fight against an approaching enemy. Quickly I made several exposures, for the bulky creature with his fifteen hundred pounds could only keep his pose for a few seconds. With the release of the shutter each time a fish was tossed as a reward which was deftly caught between the ponderous forepaws and quickly consumed on all fours on the den floor. I considered myself fortunate, however, for I secured three or four animated pictures of this giant of all beardom.

The great Gothic Flying Cage, one hundred and fifty feet long and seventy-five feet high, one of the wonders of the Zoological Park, enclosing a series of forest trees and a lake one hundred feet long, affords a remarkable place for bird photography. This is the Summer home of a numerous colony of large and handsome water birds in which they can swim, fly to and fro, build nests and rear their young in real freedom. Many are rare with beautiful plumage, such as the snowy white egret, scarlet ibis, herons and flamingoes.

Among the most showy, owing to their size and pure white plumage, which I selected for camera subjects, were the big pelicans. They are quite shy of strange intruders inside their cage, but I used a dense cluster of foliage for a "blind" and



SULTAN—BARBARY LION.
(Taken With Ross Telecentric Lens, Stop F/8, 1/50 Sec. Exposure.)
Illustrating Article "Wild Animal Photography," by Walter L. Beasley.

awaited the animated occasion of feeding time. Then the pelicans do their spectacular "stunt" of fish-swallowing. Opening their long amber-colored bills and gular pouch, they earnestly solicit a good size fish to be thrown by the keeper. Thus in ambush, some thirty feet away, with aperture F/8 and using shutter speed of 1/100 of a second, I caught a bevy of the hungry pelicans with wide open pouches, quite ready to engulf a fish displayed in the keeper's hands.

Among the noteworthy wild captives in the park is "Sultan," who has been the favorite model for all the leading animal sculptors and painters of recent times, and likewise the despair of many photographic artists. I was lucky, after several mornings of reconnoitering, to find this handsome and regal beast idly resting and sunning himself in the rear of his outdoor cage. For the instant I attracted his attention when I secured the spirited picture here reproduced, showing this king of beasts with head proudly erect and on the alert. The stop being F/8, time 1/50 of a second. From my practical experience the "Telecentric" should prove a handy and valuable lens for all those bent on obtaining wild animal pictures, in the field or near home, especially bird explorers, sportsmen, big-game hunters who desire large, sharp images of distant objects.



THE CITY GATE. JAMES DANA.



PORTRAIT. William Shewell Ellis.



PHOTOGRAPHING AEROPLANES

By CHARLES H. FLOOD

YOU know the sportsman will plod for hours along country roads and through the brush to get a shot at a partridge or quail, and if he bags four or five birds he has had great sport, and so he has, for it is fun to be out in the open, especially if you have a good bird dog with you.

Now there is another kind of bird hunting. These birds have wings that spread sixty feet. The whir they make getting off the ground is like a flock of five hundred partridges leaving cover at the same time. They fly over hills and valleys, river, lake and ocean, at the rate of over one hundred miles an hour.

I have shot these birds time and again and it is good sport. You wait for them to fly near you the same way you wait for hours in the cold mornings of October trying to get a duck. I hunt these big fellows with a 3-A Kodak fitted with a Ross Homocentric lens, a direct view finder and a Tenex shutter with an antineous release.

If they come within range with this outfit I can get them every time. It is amusing to see with what disgust the professional newspaper photographer views my outfit as compared with his 5 x 7 reflex; but unless he is a contortionist I can get pictures that are not available with his camera, for it is not the easiest thing to point a reflex lens directly overhead while looking into the hood.

Photographing aeroplanes is comparatively simple, for you fix the focus at infinity and shoot away; but to get pictures a trifle out of the ordinary you must observe a few rules.

The bright sunlight is not good. The ideal condition is when the clouds are good and heavy with the sun going in and out of them in the late afternoon. You are limited in your composition. The very nature of the subject requires

that it be put against the sky, and as a blank sky is almost as uninteresting as a college freshman, you need clouds.

I find it best to take these pictures near sundown, with the camera pointed to the sun if it is behind a cloud. The birds like to fly at this time. The air is calmer with less chance of the atmosphere being what the aviators call "cheesy," full of holes.

Pictures of aeroplanes on the ground or just leaving the ground are of little pictorial value. You must give the impression of flight. If any ground is included have a mere strip which shows a good horizon. Worm's-eye views are sometimes interesting, but the best view is gotten with the plane coming toward you just before it passes, or as it moves away. You must be close to them or your negative will show a mere speck. Rapid shutter speed is not necessary, 1/100th or 1/200th of a second stops any perceptible motion, and with the sky to help out these times may be used late in the afternoon. Your negatives will make beautiful enlargements of good size without loss of definition. Do not expect too much in results. The fun comes in watching the flying and trying to get the bird "on the wing."



GRAHAME WHITE IN HIS NEUPORT MONOPLANE. CHAS H. FLOOD.



SUNLIGHT AND SHADOWS. CHARLES H. FLOOD.

SOFT PRINTS FROM CONTRASTY NEGATIVES

By WM. H. ZERBE

NOTWITHSTANDING the perfection to which developing or gaslight papers have been brought, there is still something to be desired when an extremely contrasty negative is used. I mean the kind that we sometimes call "as hard as nails." Perhaps the papers are not so much at fault as the developers used with them.

The manufacturers publish very instructive booklets on how to use their products, but their developing formulæ are very nearly all alike and I have never seen any suggestions to modify the developers to obtain different results.

Recently I had some extremely contrasty negatives to print from and I tried several makes of soft grades of paper, but was unable to get soft enough print with normal developers. If exposure was made for the shadows I got nothing in the high lights and the half-tones were lost, and if exposed and developed for the high lights the shadows were too dark and lacking in detail.

After some experimenting I have worked out a developer which will give any degree of softness from the most contrasty negatives. I call this a gray developer and it is made up as follows:

STOCK SOLUTION.

Water	20 ounces
Metol	30 grains
Sulphite of soda (dry)	1 ounce
Carbonate of soda (dry)	1½ ounces

For use take one ounce of developer to four to six ounces of water and add enough bromide of potassium to hold the whites. As hydroquinon in a developer gives density, it will be noticed that none is used. A longer exposure is necessary than with a normal developer. The print takes from two to



CHILD PORTRAIT. E. H. Weston.



three times as long to come up and will not have such a long scale of tones. The high lights and half-tones will show stronger than in a print developed in the usual developer, but the shadows will not be so black and will show any detail that is in the negative.

Figure 1 is a print on Professional Cyko from a very hard negative developed with regular developer. Figure 2 is a print on regular soft grade Cyko from the same negative and developed in the gray developer. If darker or intermediate tones are desired add from five to thirty grains of hydroquinon to the stock solution. This developer gives splendid results where a short scale of tones is desired, such as decorative flower studies and Winter scenes. There are a great many who do not use developing papers for their pictorial work, preferring to use some printing out process. To such I will give another method for getting soft prints from hard negatives.

My favorite printing medium is carbon, and in this as well as other printing out processes the contrasty negative is not the ideal one.

Persulphate of ammonia perhaps could be used to cut down some of the contrast, but in my hands this has worked so uncertainly that I hardly ever use it now. I have adopted the plan of making duplicate negatives from the originals. I first make a contact positive in the usual way, but instead of using a slow plate I use one of the ordinary speed, such as Cramer Crown, Standard or Seed 26x. We are after softness and slow plates give contrast. Exposure will have to be sufficient to bring out the detail in the high lights. Instead of using the usual developer I use the gray developer used for paper mentioned above, using one to four. Leave the positive in the developer until it looks somewhat like a print when looking on the face of it, or when viewed through the light until the detail is shown in the high lights. Remember we are after softness, so do not bother about density, for this developer will not give it. After fixing and viewed through the light the positive will look almost like clear glass, but if laid upon a piece of white paper every bit of detail will be seen, but quite gray instead of black, as in the usual kind of positives.

After it is washed and dried it is ready to make the dupli-

cate negative from it. This is made in the same way as the positive was made, excepting that we print from the thin positive instead of the contrasty original negative. As we are still after softness the same brand of plate is used. Exposure in this case will have to be very short, for remember the positive is almost clear glass. This plate can now be developed in a normal or regular developer, but do not expect to see it come up as snappy and crisp as a negative made in the usual way. It will have the appearance of an overexposed plate and must be carried far enough. If too dense it can be reduced with ferricyanide and hypo. If instructions are carried out you will get from your contrasty negative a duplicate very much softer, depending on how thin a positive was made in the first place.

Figure 3 is a print from a duplicate negative made in this way from the original negative from which Figure 1 was printed. Note that all the detail has been retained, and the shadows show considerable detail which could not be secured from the original negative.



Figure 1.

(Print On Prof. Cyko From A Very Hard Negative Developed With A Regular Developer.)



Figure 2.
(Print On Regular Soft Grade Cyko Developed In Gray Developer.)



Figure 3.
(Print From Duplicate Negative.)
Illustrating Article "Soft Prints From Contrasty Negative," by Wm. H. Zerbe.



Figure 4.
Illustrating Article "Snow Scenes," by P. S. Hunt.



Figure 3.
Illustrating Article "Snow Scenes," by P. S. Hunt.

SNOW SCENES

By P. S. HUNT

ONE thing very sure is that we all have more or less our own way of doing things, and the above title is one that I think is treated in the greatest variety of ways.

The most universal instructions that you will find in all kinds of magazines are to give 1/12 normal exposure for snow or clouds. Some vary on the question of clouds from ½ to 1/12 the exposure that a landscape should have. Do not think that I will attempt to tell some of these that they do not know what they are talking about. I do think, though, that the most of them are written from theory and not from practice. It seems impossible for me to get anything like results from such short exposures.

Another thing that we find so often in instruction books, magazine articles, etc., is to keep the sun behind you, or nearly so. Just ask yourself a few questions and see if you think this is right.

How would a portrait look if the light came from the back of your camera? Take a properly lighted print and place it beside one that is lighted from back of your camera and compare them. Take any subject and make like comparisons. To make the point clear so that you will understand why I differ from so many, I will say that it is my opinion that the instructions originated with makers of cameras in the earlier days, when the lenses were very imperfect, and it was necessary to take snapshots in that way in order to get all the light possible.

Now this is not what the title calls for. It is, however, very important and right to the point, and is to impress upon your mind the real points that are at issue. Source of light, the time, place and exposure—things that will vary with every picture.

The illustrations with this article will more strongly emphasize the point I am trying to make clear. In Figure 1 you will note that the light is coming from nearly behind me; the picture is quite flat; the frost on the trees (and snow) is merely white stuff on the trees—that on the ground is a trifle better.

In Figure 2, taken within ten minutes of the other, the light comes at right angles and the snow looks like snow, not a white mass as in Figure 1. However, the low light (low sun) assists the latter very much. If the sun had been higher it would merely have been two masses, one white, the other black. In fact it is not the snow that you should look for, but the shadows. Select the point where you can get the best picture of the shadows. The snow part will come out to your satisfaction. Just try this on all kinds of subjects. Look for the best point from which to take a picture of the shadows. Very few subjects would be a failure from this way of selecting your position.

In Figure 2 note how the frost on the trees stands out like frost, the snow looks like snow, the shadows as you can see are the whole picture, soft, transparent and pleasing. One thing, though, that makes the picture please you most is the



Figure 1.

Illustrating Article "Snow Scenes," by P. S. Hunt.

low position of the sun. If the sun had been behind me the tree on the extreme left would have been almost invisible against a white hill behind.

The three views of my old studio are another set that will prove the very same points. In Figure 3 the sun was nearly behind me; in Figure 4 at right angles, and in Figure 5 nearly in front of me, except that the sun was lower, and as you can see, the effects are very much better.

The moral is to get at least half of the subject in shadows, if not three-fourths, merely tipping the edges and tops with the high light, then "expose for the shadows and let the high lights take care of themselves." I would no more think of underexposing a snow scene or cloud picture than a green lawn full of red flowers.

The time to take snow scenes is when the air is perfectly clear, not the least haze. Early in the morning is much better than late in the evening. I say early or late, the air as a rule being much clearer in the morning.

The light must be sufficiently strong to give full and decided shadows.



Figure 2.
Illustrating Article "Snow Scenes," by P. S. Hunt.



Figure 5.
Illustrating Article "Snow Scenes," by P. S. Hunt.

PHOTOGRAPHY FOR SCIENTIFIC PURPOSES

By WILLIAM C. BARBOUR

EACH particular form of photography has its purpose or aim which controls or limits both method and results. So, at the outset let us try to define our special brand by its requirements. First of all, it must tell the truth with the greatest possible exactitude. "Impressions" must be laid aside and artistic sense must be subordinated. Things which are not essential to the object shown must be put into the background as far as possible or removed altogether. A good nature photograph must show some particular form or structure and should call the attention of the student to that one thing only.

To obtain sharp and clear negatives we must have a lens of sufficient covering power and depth of focus that no part of our object shall be indistinct or "fuzzy." It is excellent practice, when possible, to stop down the diaphragm very far and give an exposure correspondingly long to compensate for it.

For out-of-door work upon objects which may move of their own accord, or may be moved by the wind, a fast plate which is brilliant yet gives full details must be used. Sometimes a wind-break of some kind may be devised, but more often the photographer's patience must be stretched to the breaking point—or beyond it—while waiting for a breeze to subside. For the breeze is sure to come just at the wrong instant. If locality and light are left to our choice, a diffused light which does not throw a troublesome shadow is selected.

For work where we do not have to reckon with motion as a factor, or where colors of low actinic value are present, an orthochromatic plate should be chosen and with it a ray filter should be used. For such work the writer has used with excellent results the regular filter furnished by the Lumière-Jougla Company for use with the Autochrome plates. Of

course this may seem an over-correction, but the results are generally highly satisfactory in practice.

A series of screens in yellow, orange, light red, blue and green should be provided for use with special color combinations. For many subjects, such as flowers and butterflies, an adequate representation is impossible without this use of color screens.

In many cases the angle at which the light strikes the objects makes the difference between distinctness and flatness. This has mainly to do with pictures for geographic or geologic work, such as peculiar topographic forms which show best when one side has a shadow background.



LARVA OF AUTOMERIS IO. WILLIAM C. BARBOUR.
Colors: Green, pink and white.
(*Standard Polychrome plate, with filter.*)

When a plant or an insect is photographed with the natural background, every effort is made to get rid of all extra objects which would come into the same focal plane. Sometimes an object holder which will come below the range of the plate may be used.

Many objects can be best handled by means of a camera held vertically upon a sliding base, the object being supported upon a sheet of plate glass several inches above a background of the desired tint. In cases where a horizontal camera is

most convenient, if the background is held about a foot from the object and is kept in motion by an assistant, the result is excellent.

The tripod stands which admit of unusual freedom in tilting are desirable adjuncts, as also are tripod stays to hold apparatus rigid in outdoor work.

Most nature photographs should be made to a certain definite scale, whether life size or smaller. This knowledge of scale is sometimes a very important factor. A foot rule or a meter stick may be introduced in the edge of the view, or the object and the image on the ground may both be measured for record. The size of the image is only secondary to its sharpness. A good negative should stand enlargement to any reasonable extent without loss of sharpness.



MOTH AND ITS PUPA CASE. WILLIAM C. BARBOUR.
(Cramer Slow Iso, with Lumiere filter.)



MISS P.

George P. Swain.

American Annual Formulary

In the following section we have gathered together a typical collection of Formulæ and Tables, which will assist the photographer in his every-day work. It will be noticed that makers' formulæ are omitted. These can best be obtained by direct application to the makers. The appended formulæ are selected from the working methods of practical photographers.—Editor.

DEVELOPERS FOR LANTERN SLIDES

Hydroquinone (B. H. Allbee). No. 1.—Hydroquinone, 150 grains; metabisulphite potash, 10 grains; bromide potassium, 50 grains; water, 20 ounces.

No. 2.—Sulphite soda (dry), 1 ounce; caustic soda, 100 grains; water, 20 ounces. Take equal parts of No. 1 and No. 2.

Hydroquinone for colder tones (B. H. Allbee). No. 1.—Hydroquinone, 60 grains; sulphite soda (dry), 1 ounce; citric acid, 10 grains; bromide potassium, 10 grains; water, 10 ounces.

No. 2.—Carbonate soda (dry), 1 ounce; water, 10 ounces. Use equal parts.

TRAY DEVELOPERS FOR NEGATIVES

Adurol. No. 1.—Water, 10 ounces; sodium sulphite, 1¾ ounces; adurol, 85 grains.

No. 2.—Water, 10 ounces; potassium carbonate, 1¼ grains. For average outdoor exposures use equal quantities Nos. 1 and 2; for fully timed exposures take 1 ounce each of No. 1, No. 2, and water.

Amidol. A concentrated developer.—Water, 13 ounces; sodium sulphite (crystals), 2½ ounces; when dissolved add amidol, ¼ ounce. The solution keeps fairly well in bottles completely full and well corked. For use take 1 ounce of the concentrated solution and dilute with 3 or 4 ounces of water.

Duratol-Hydroquinone—Universal Developer (M. D. Miller).—Hot water, 16 to 32 ounces; Duratol, 15 grains. Dissolve and add, previously well mixed in the dry state, sodium sulphite, anhydrous, 440 grains; sodium carbonate, anhydrous, 660 grains. When dissolved, add hydroquinone, 60 grains. Use undiluted for contrasty gaslight papers. Dilute with an equal part of water for soft gaslight and bromide papers, plates, and films. For tank development at 65° Fahr. Dilute 1 to 1 and develop 12 to 15 minutes. Dilute 1 to 2 and develop 16 to 22 minutes. Dilute 1 to 3 and develop 26 to 34 minutes. Developer without bromide gives blue-black tones; small quantities of bromide give pure black; larger amounts, warm blacks.

Edinol-Hydro for Panchromatic Plates.—Water, 30 ounces; edinol, 120 grains; hydroquinone, 120 grains; sodium sulphite (dry), 768 grains; carbonate potassium, 1344 grains; 10 per cent. bromide potassium solution, 1 dram; 10 per cent. oxalic acid solution, 1 dram. For tank use 1 ounce of above to 15 ounces water; temperature, 65 degrees; time, 15 minutes. For tray use 1 ounce above to 4 ounces water.

Glycin-Metol (*M. D. Miller*).—Water, 20 ounces; metol, 60 grains; sodium sulphite, anhydrous, 240 grains; sodium carbonate, anhydrous, 440 grains; glycin, 120 grains. Dilute with an equal volume of water. Wash plate thoroughly before fixing to prevent indelible yellow stain.

Metol-Hydro-Eiko, for Double-coated Ortho Plates (*H. S. Hood*).—Water, 15 ounces; metol, 24 grains; hydroquinone, 24 grains; eikonogen, 24 grains; sodium sulphite (dry), ½ grain; sodium carbonate (dry), 320 grains; potassium bromide (10 per cent. solution), 4 drops.

Metol-Hydro-Eikonogen (*Hood*).—Water, 150 ounces; metol, ½ ounce; hydroquinone, ½ ounce; sodium sulphite (dry), 5½ ounces; sodium carbonate (dry), 6 ounces. This can be kept in a hard rubber tank for five days before exhausted by oxidation.

Metol-Hydroquinone for Orthochromatic Plates.—Water, 20 ounces; metol, 14 grains; potassium metabisulphite, 18 grains; hydroquinone, 56 grains; sodium sulphite, 1 ounce; sodium carbonate, 1¾ ounces. Use 1 drop of a 10 per cent. potassium bromide solution to each ounce only if necessary.

Pyro (*J. D. Elliott*).—Sulphite soda, 40° solution, 4 ounces; carbonate soda, 20° solution, 4 ounces; pyro, 10 grains.

Pyro, for Overtimed Plates (*J. D. Elliott*).—Sulphite soda, 40° solution, 4 ounces; water, 4 ounces; pyro, 10 grains. Immerse plates in this solution for 20 minutes in the dark; then add to above solution ½ drachm carbonate soda, 20° solution. When image appears add one more drachm of the carbonate soda solution.

Pyro Soda (*Mellen*). No. 1.—Water, 20 ounces; sodium sulphite (crystals), 4 ounces; carbonate of soda, 2 ounces. Dissolve the sulphite first and then add the carbonate.

No. 2.—Water, 6 ounces; pyro, 1 ounce. For correct exposures take 1 dram of No. 2; 1 ounce of No. 1, and add 2 ounces of water. For snapshots, or plates thought to be under-exposed, use 1 dram of No. 2; 1½ drams of No. 1, and 6 ounces of water. For over-exposure take 2 drams of No. 2, 1 ounce of No. 1 and 6 ounces of water. Or, instead of the 2 drams of No. 2 in this solution use 1 dram of No. 2 and 10 drops of a 10 per cent. solution of potassium bromide.

Pyro-Metol-Acetone (*Cramer*). No. 1.—Water, 60 ounces; metol, 1 ounce; citric acid, 40 grains; pyro, 1 ounce; sodium sulphite (dry), 6 ounces.

No. 2.—Water, 48 ounces; liquid acetone, 12 ounces. For plates take 1 ounce No. 1, 1 ounce No. 2, water 5 ounces. For tank take 1 ounce No. 1, 1 ounce No. 2; water, 13 ounces.

TANK DEVELOPERS FOR NEGATIVES

Adurol (*Montgomery*). Water, 20 ounces; sulphite soda (anhydrous), 220 grains; carbonate of soda (anhydrous), 220 grains: adurol, 45 grains. For use take 1 ounce of above to 4 ounces water; add 2 drops 10 per cent. bromide solution; temperature, 65 degrees; time, 25 minutes.

Glycin (*Montgomery*). Water (hot), 8 ounces; sulphite of soda (anhydrous), 50 grains; carbonate of soda (anhydrous), 240 grains; glycin, 45 grains. For use take 3 ounces of above and 37 ounces water; temperature, 65 degrees; time, 25 minutes.

Metol Hydro (*Frew*). Water, 12 ounces; metol, 7½ grains; sulphite of soda (anhydrous), 274 grains; hydroquinone, 30 grains; carbonate of soda (anhydrous), 150 grains; bromide of potassium, 2 grains. For use to each ounce of above add 4 ounces of water; temperature, 65 degrees; time, 12 minutes.

Ortol (*Smith*). Water, 60 ounces; metabisulphite of potassium, 15 grains; sulphite of soda (anhydrous), 100 grains; carbonate of soda (anhydrous), 100 grains; ortol, 30 grains; temperature, 65 degrees; time, 20 minutes.

Rodinal (*Agfa*). Water, 60 ounces; rodinal, 1 ounce; temperature, 65 degrees; time, 25 minutes.

FIXING BATHS AND HARDENERS

Acid Fixing Bath (*Carbutt*).—Sulphuric acid, 1 dram; sodium hyposulphite, 16 ounces; sodium sulphite, 2 ounces; chrome alum, 1 ounce; warm water, 64 ounces. To prepare the bath, dissolve the hypo in 48 ounces of water; the sodium sulphite in 6 ounces; mix the sulphuric acid with 2 ounces of the water and pour slowly into the sulphite solution, and then add to the hypo solution. Dissolve the chrome alum in 8 ounces of water; add to the bulk of the solution and the bath is ready for use.

Acid Fixing Bath (*M. D. Miller*).—Hypo, 8 ounces; water, 1 quart; Lumiere's sodium bisulphite lye, 1 to 2 ounces, to which may be added, if greater hardening is desired, powdered alum, 220 grains.

Fixing Bath for Lantern Slides (*B. H. Allbee*).—Sulphuric acid, 1 dram; hypo, 16 ounces; sulphite soda (dry), 1 ounce; chrome alum, 1 ounce; water, 64 ounces.

Plain Fixing Bath.—Dissolve 1 pound of sodium hyposulphite in 2 quarts of water or 4 ounces of the hypo in a pint of water, according to the bulk of the solution required.

Hardener for Fixing Bath (*Beach*). Water, 40 ounces; sulphite soda (crystals), 6 ounces; powdered alum, 16 ounces; acetic acid, 40 ounces. Add in the order given and shake well until dissolved. Of the above add 16 ounces to each gallón of hyposulphite of soda solution, testing 70 to 80 degrees.

Hardening Negatives.—Immerse them for a few minutes in formalin, 1 ounce; water, 30 ounces.

INTENSIFICATION

Intensifier, One Solution (*F. M. Steadman*). No. 1.—Bichloride of mercury, ½ ounce; water, 10 ounces. No. 2.—Iodide of potassium, 5 drams; water, 1½ ounces. Add to No. 1. No. 3.—Hyposulphite of soda, 1 ounce; water, 2½ ounces. Add to the previous mixture. This clears the solution when it is ready for use for local intensification. For tray intensification add more water to slow its action.

Mercuric Chloride Process. No. 1.—Mercuric chloride, 200 grains, bromide of potassium, 120 grains; water, 6½ ounces.

No. 2.—Sodium sulphite, 1 ounce; water, 4 ounces. The well-washed negative, free from hypo, must be thoroughly bleached in No. 1; well washed; and then blackened in No. 2. After blackening it is well washed again.

REDUCTION

Reducer, Single Solution (*F. M. Steadman*).—Red prussiate of potash, size of pea; hyposulphite of soda, six times that volume; water, 6 ounces (for local reduction 1½ ounces). When reduced wash thoroughly.

Ammonium Persulphate.—Ammonium persulphate, 15 grains; water, 1 ounce. The solution should be made just before use. The negative must be perfectly free from hypo or it will be stained by the persulphate. When the desired reduction has been reached, transfer the negative without washing to a 10 per cent solution of anhydrous sodium sulphite. Wash finally for 15 or 20 minutes.

Farmer's Reducer.—Dissolve 1 ounce of potassium ferricyanide in 9 ounces of water and make up to 10 ounces, forming a 10 per cent solution. Label this poison. Thoroughly wet the negative to be reduced. Take enough fresh plain hypo fixing bath for the purpose, and add to it enough of the ferricyanide solution to make it a light straw color. The negative to be reduced is immersed in this solution, when it will be seen to lose density. Rock the tray to insure evenness of action. This reducer can also be used for local treatment.

PRINTING PROCESSES

Blue Prints.

Blue Printing Sensitizing Formulæ (Brown). A.—Dissolve 110 grains ferric ammonium citrate (green) in 1 ounce of water.

B.—Dissolve 40 grains of potassium ferricyanide in 1 ounce of water. These two solutions are made up separately. They are then mixed together and kept in a stoneware bottle, but the single solution should always be filtered before use. The mixture will retain its good qualities for months if kept from the light.

(*Millen*).—Potassium ferricyanide, 1 ounce; ammonio-citrate of iron, 1½ ounces; distilled water, 10 ounces. Mix thoroughly and filter. The solution should have a deep wine color and dry on the paper a lemon-yellow. If the solution is green and has a precipitate, the ammonio-citrate is old and spoiled. The mixture should be kept from the light.

Bromide Paper.

Bromide Paper Developers: Hydroquinone-metol. No. 1.—Water, 10 ounces; hydroquinone, 52 grains; potassium metabisulphite, 18 grains; sodium sulphite, 5 drams; sodium carbonate, 1¼ ounces.

No. 2.—Water, 10 ounces; metol, 30 grains; sodium carbonate, 5 drams; sodium sulphite, 5 drams. One or two drops of a potassium bromide 10 per cent solution added to 1 ounce of the mixed developer will increase contrast and keep the whites pure. Equal parts of 1 and 2 give excellent prints from a normal negative; one part of 1 and two of 2 give gray prints with maximum half-tone and gradation; two parts of 1 and one of 2 give vigorous prints from soft delicate negatives.

Amidol for rich blacks (freshly prepared). Distilled (or boiled) water, 4 ounces; sodium sulphite (crystals), 90 drams; amidol, 10 to 15 grains. Add a drop of 10 per cent bromide solution to each ounce of developer.

Bromide Prints: Toning Formulæ for Sepia Tones: Hypo Alum.—Hyposulphite of soda, 5 ounces; ground alum, 1 ounce; boiling water, 70 ounces. Dissolve the hypo in the water, and then add the alum slowly. A milk-white solution results which should be decanted when clear. It is not used until cold (about 60° Fahr.).

Sulphide of Sodium.—The fixed and washed print is treated with one of the following solutions: (1) Potassium ferricyanide, 10 grains; potassium bromide, 10 grains; water, 1 ounce; or (2) potassium ferricyanide, 20 grains; sodium chloride (common salt), 30 grains; water, 1 ounce. The image will be bleached by either of these solutions in a few minutes, the whitish appearance of the deposit being caused by its change into a salt of silver. After 5 minutes in running water apply the sulphuretting solution: Dissolve 3 ounces of sodium monosulphide in 15 ounces of water; boil the solution for about 10 minutes, filter off the black precipitate formed, and when cooled make up to 25 ounces with water. To tone, take 12 per cent stock sodium sulphide solution, 1 ounce of water, 12 to 20 ounces.

Red Tones: Copper.—Dissolve 100 grains of ammonium carbonate in 2 ounces of water, and in this solution dissolve 10 grains of sul-

phate of copper. Then add 20 grains of potassium ferricyanide. A clear, dark green solution results which gives a red-chalk tone in about 3 minutes. Tone until the deepest shadow is converted, and then wash the print for 10 minutes.

Green Tones: Vanadium.—Bleach print in the following: Potassium ferricyanide, 10 grains; ammonium carbonate, 100 grains; water, 1 ounce. Wash well and apply: Ferric chloride, 2 grains; vanadium chloride, 2 grains; ammonium chloride, 4 grains; hydrochloric acid, 5 minims; water, 1 ounce.

Blue Tones: Iron.—Bleach print in: Potassium ferricyanide, 10 grains; ammonium carbonate, 100 grains; water, 1 ounce; then tone in ferric chloride, 5 grains; hydrochloric acid, 5 minims; water, 1 ounce.

To prevent blistering on bromide paper (P. L. Anderson).—Immerse after fixing and before washing from 10 to 15 minutes in water, 10 ounces; formaldehyde, 1 ounce. A 10 per cent solution of chrome alum will do equally well.

To make bromide paper translucent (P. L. Anderson).—Lay the paper negative face down on a blotter and paint thinly with the following mixture. Give three coats. Turpentine, 3 ounces; powdered resin, 1 ounce; gum elemi, 1 ounce; paraffine wax, ½ ounce. Heat with stirring until it begins to boil. Allow to cool slightly and add turpentine, 3 ounces.

Carbon Tissue.

Carbon Tissue, Sensitizer for (Bennett).—Potassium bichromate, 4 drams; citric acid, 1 dram; strong ammonia water, about 3 drams; water, 25 ounces; dissolve the bichromate and citric acid in hot water, and add sufficient ammonia to change the orange color of the solution to lemon-yellow. Sensitize for 90 seconds; reducing the water softens the gradation in the print; increasing it to 30 ounces gives more vigor.

Carbon Lantern Slides.—Prepare the glass by coating with the following preparation: 180 grains of Nelson's Gelatine No. 1, in 20 ounces water. Add 10 grains bichromate of potash. Dry and allow the plate to be exposed to light for a couple of days to make the coating thoroughly insoluble. Sensitizer for tissue: 1 per cent to 1¼ per cent solution of bichromate of potash. Immerse 2 minutes. Print deeply; expose twice as long as ordinary paper print. Develop in hot water as usual.

Gum Bichromate.

Gum Bichromate (Caspar Millar). A.—Gum arabic, 1¼ ounces; water, 3½ ounces; salicylic acid, 4 grains.

B.—Chrome alum, 45 grains; water, 3½ ounces. Grind A and B with water and pigment, brush over paper, dry and store.

Suggested formula.—A, 2 ounces; B, 1½ drams; carbon black, 10 grains; sensitize for 2 minutes in 5 per cent bichromate solution.

Kallitype.

Kallitype Sensitizer for Black Tones (J. Thomson).—Distilled water, 1 ounce; ferric oxalate (Merck's or Mallinckrodt's) 15 grains; citrate of iron and ammonia (brown scales), 25 grains; chloride of copper, 8 grains; oxalate of potassium, 35 grains; oxalic acid, 15 grains; silver nitrate, 15 grains; gum arabic, 10 grains. For greater contrast add 1 to 10 drops 5 per cent bichromate of potassium solution.

Developer: Stock Solution.—Distilled water, 1 ounce; silver nitrate, 40 grains; citric acid, 10 grains; oxalic acid, 10 grains. Filter. Normal developer 1 dram stock solution and 7 drams of water.

Platinum Papers.

Platinum Sensitizer (P. L. Anderson).—No. 1. Oxalic acid, 16

grains; ferric oxalate, 240 grains; distilled water (hot), 16 drams; oxalic acid, 16 grains. No. 2. Ferric oxalate, 240 grains; potassium chlorate, 4 grains; distilled water (hot), 16 drams. No. 3. Potassium chloroplatinite, 219 grains; distilled water, 19 drams. For use take No. 1, 14 mm.; No. 2, 8 mm.; No. 3, 28 mm.

Platinum: Sensitizing Gold Bath and Sepia Papers. A.—Chloroplatinite of potassium, 15 grains; distilled water, 90 minims.

B.—Ferric oxalate, 21 grains; oxalic acid, 2 grains; distilled water, 183 minims. For cold bath paper, mix A and B, and add 15 minims of water. For sepia paper mix A and B and add 15 minims of a 5 per cent solution of mercuric chloride. The addition of a few grains of potassium chlorate to any of the above gives increased contrast in the print. From 140 to 170 minims of solution are sufficient to coat a sheet of paper 20 x 26 inches.

Platinum Prints: to Intensify. A.—Sodium formate, 45 grains; water, 1 ounce.

B.—Platinum perchloride, 10 grains; water, 1 ounce.

C.—For use, take 15 minims each of A and B to 2 ounces of water. Immerse prints until sufficiently intensified, then remove and wash.

Gold Toning.—For blue-black tones, for slight strengthening, and for converting rusty black into pure black. Soak print in warm water, lay on warm glass, brush over glycerine and blot off. Pour on few minims of solution of gold chloride (1 grain per dram), and rapidly brush in all directions. When toned, rinse, and sponge back and front with: Metol, 50 grains; sodium sulphite, 1 ounce; potassium carbonate, ½ ounce; water, 20 ounces. Tone in daylight. Do not tone sepias or old prints in this solution.

Platinum Prints: to Distinguish from Bromide.—Soak the print in saturated solution of mercuric chloride; a platinum print will not change; a bromide print will bleach.

Salted Papers.

Salted Paper Prints: Sensitise with the following:—Silver, 480 grains Troy; water, 11 ounces. Dissolve and pour off 2 ounces, and to the 9 ounces left add strong aqua ammonia to form a precipitate and redissolve the precipitate, then add the remaining 2 ounces which will form another precipitate, to this add 9 drops of nitric acid C. P. Apply this to the paper with a tuft of cotton.

Any good Toning Bath will give good results, such as: Chloride Aluminum, 80 grains; bi-carbonate soda, 360 grains; water, 48 ounces. When mixed this will form a flocky hydrate which will settle to the bottom. It can be strained through clean washed muslin. To prepare a small bath for toning, take 12 ounces of the stock solution and add sufficient gold to tone in 8 to 10 minutes. The gold solution must be neutralized with bi-carbonate soda before adding to the above bath. When the prints reach the desired tone throw them into a bath of salt water, made of water, 1 gallon; table salt, 1 ounce.

MISCELLANEA

Adhesive for Labels.—Soak 1 part of the best glue in water until thoroughly swollen, add a little sugar candy, 1 part of gum arabic and 6 parts of water. Boil with constant stirring over a spirit lamp until the whole gets thin. Coat sheets of paper with it; let dry and cut up into convenient sizes.

Backing Mixture.—Dissolve a 4-ounce stick of licorice in 8 ounces of water with the aid of gentle heat. When dissolved rub into the mixture 1 ounce of burnt sienna in powder, using the back of a spoon for this purpose. When cold, bottle for use.

Blackening Brass.—Make two solutions: Copper nitrate, 200 grains; water, 1 ounce. Silver nitrate, 200 grains; water, 1 ounce. Mix the solutions; clean the article well; dip it in the solution for a moment; withdraw it; dry it; and heat it strongly.

Black, Dead, for Wood.—Shellac, 40 parts; borax, 20 parts; glycerine, 20 parts; water, 500 parts. When dissolved, add 50 parts aniline black.

Cleaning Greasy Bottles.—Wash with benzine, or permanganate of potassium, to which has been added some hydrochloric acid.

Bottles that have contained resinous substances, wash with potash or soda and rinse with alcohol. Bottles that have contained essences, wash with sulphuric acid, then with water.

Clearing Stained Negatives.—Dissolve ⅛ ounce of pulverized alum in 20 ounces of water and add 1 dram of sulphuric acid. Immerse the stained plate in this solution for a few minutes; remove plate, wash, and then set in the rack to dry.

Film: to Remove from Glass: Make two solutions. A.—Sodium fluoride, 6 grains; water, 4 ounces.

B.—Sulphuric acid, 6 drops; water, 1 ounce. Place the negative in solution A for 2 minutes and then place directly in solution B. After another 2 minutes lift the film with the finger from one corner of the plate. It will soon leave the glass.

Firelight Effects on Developing Paper (H. S. Hood). No. 1.—Water, 5 drams; copper sulphate, 10 per cent solution, 15 minims; ammonium carbonate, 10 per cent solution. Add till precipitate first formed is redissolved.

No. 2.—Water, 4½ ounces; potassium ferricyanide, 6/10 drams. Mix separately and add No. 2 to No. 1. The print will turn bright red. Wash well.

Ground Glass Varnish: Sandarac, 90 grains; mastic, 20 grains; ether, 2 ounces. Dissolve the resins in the ether and add benzole ½ to 1½ ounces.

Substitutes for Ground Glass. 1.—Paraffin wax makes an excellent substitute for ground glass if the latter should get broken. Iron the paper onto a sheet of plain glass. It is more transparent than the focusing screen and the image will appear clearer; hence, in exposing allowance must be made for the difference in illumination.

2.—Resin dissolved in wood alcohol and blown over the glass; this must not be scratched; it gives a very fine-grained ground glass effect.

3.—White wax, 120 grains; ether, 1 ounce.

Lens: to Clean.—The lens should always be kept free from dust or other impurities. To clean it, spread upon a table a clean sheet of paper; take the lens apart, and with a camel-hair brush dust each of the combinations on both sides. If the surfaces of the lenses are very dirty and have lost their polish, make up the following: Nitric acid, 3 drops; alcohol, 1 ounce; distilled water, 2 ounces. Dip a tuft of filtering cotton in this solution, rub each side of the lens, then polish with an absolutely clean chamois. Clean the lens tube before replacing the lenses, each of which should be finally dusted with a camel-hair brush.

Moonlight Effects on Developing Paper (H. S. Hood).—Immerse in water, 5 ounces; ferric ammonium citrate, 12 grains; potassium ferricyanide, 12 grains; nitric acid, 2/5 drams. Prints will assume a blue color. Wash until whites become clear.

Poisons and Antidotes.—Administer the antidote as soon as possible. If a strong acid or alkali, or cyanide of potassium, has been swallowed, lukewarm water in large quantities should be swallowed

at once. Where strong acids or alkalies have not been swallowed, rid the stomach of the poison by vomiting; for this purpose take 25 grains of zinc sulphate in warm water.

Polished surfaces: to Photograph.—Smear the surface with soft putty so as to deaden the reflections. Photograph the article against a black background, and stop off all reflections, allowing the light to come from one direction only. To photograph hollow cut glassware fill with ink or aniline black water dye. Before photographing machinery deaden the bright parts with putty.

Retouching Mediums. (1.)—Pure alcohol, 2 parts; sandarac, 1 part; benzine, 4 parts; acetone, 4 parts.

(2.)—A simpler medium is made by dissolving a little resin in turpentine.

Retouching Medium.—Gum dammar, 10 grains, and add it to oil of turpentine, 1 ounce; Canada balsam (about) 5 grains. Shake occasionally until all is dissolved.

Safe Light for Panchromatic Plates.—Take old dry plates and coat with the following: Water, 10 ounces; tartrazine, 75 grains; patent blue A, 75 grains; naphthol green, 75 grains; sulphuric acid, 30 minims. Stain the plates as deeply as possible. Use two plates.

Stains: to Remove from the Hands.—Developer stains: solution of citric or oxalic acid. Silver nitrate stains: Water, 4 ounces; chloride of lime, 350 grains; sulphate of soda, 1 ounce. Apply with a brush.

Tarnished Daguerreotypes, to Restore.—Remove the silvered plate from the case and place it, image uppermost, under a box lid or other protector from dust, etc. Put a small piece of potassium cyanide into a graduate and pour over it 1 or 2 ounces of water. Hold the daguerreotype by the corner with a pair of pliers, rinse it in clear running water, then pour over it the weak cyanide solution (a 3 per cent solution is usually employed), and return it to the graduate. Repeat this operation several times until the discoloration quite disappears. Wash well in running water, and then, before the surplus water has time to collect in tears upon the image, begin to dry the plate gradually over a spirit lamp, holding the plate in an inclined position so that it will dry from the uppermost corner. The secret of success is in the use of pure water for the final washings and the drying of the image without check or the formation of tears.

Test for Hypo: Potassium permanganate, 2 grains; potassium carbonate, 20 grains; distilled water, 40 ounces. Soak the plate or print to be treated in water for one hour, then remove and add to the water a few drops of the above solution, which will turn a greenish yellow or brown if the water is not free from hypo.

Varnish for Negatives and Lantern Slides.—Dissolve 1 part of gum sandarac in 25 parts of benzole. Apply cold.

Protective Varnish for Labels.—Use waterproof ink when writing on the paper. Dry, and coat with the following varnish: Cut into fine shreds an old celluloid negative film from which all traces of gelatine have been removed. Put the shreds in a small bottle; half fill with amyl acetate and then add wood alcohol or methylated spirit which will dissolve the celluloid.

Waxing Solution: Spirits of turpentine, 6 ounces; Japan drier (white), 4½ ounces. Sprinkle the fluid on the print and rub in with cheesecloth.

THE ELEMENTS

THEIR NAMES, SYMBOLS, AND ATOMIC WEIGHTS. OXYGEN STANDARD

Compiled by HENRY F. RAESS

Aluminum	Al	27.1	HYDROGEN	H	1.008	Rubidium	Rb	85.4
Antimony	Sb	120.2	*Indium*	In	114	Ruthenium	Ru	101.7
Argon	A	39.9	Iodine	I	126.85	*Samarium*	Sm	150.
ARSENIC	As	75.0	IRIDIUM	Ir	193.0	*Scandium*	Sc	44.1
Barium	Ba	137.4	*Iron*	Fe	55.9	Selenium	Se	79.2
Bismuth	Bi	208.5	Krypton	Kr	81.8	Silicon	Si	28.4
Boron	B	11	*Lanthanum*	La	138.9	SILVER	Ag	107.93
BROMINE	Br	79.96	*Lead*	Pb	206.9	SODIUM	Na	23.05
Cadmium	Cd	112.4	LITHIUM	Li	7.03	Strontium	Sr	87.6
Caesium	Cs	132.9	Magnesium	Mg	24.36	SULPHUR	S	32.06
Calcium	Ca	40.1	MANGANESE	Mn	55.0	*Tantalum*	Ta	183
CARBON	C	12.00	MERCURY	Hg	200.0	Tellurium	Te	127.6
Cerium	Ce	140.25	MOLYBDENUM	Mo	96.0	*Terbium*	Tb	160
Chlorine	Cl	35.45	Neodymium	Nd	143.6	*Thallium*	Tl	204.1
Chromium	Cr	52.1	*Neon*	Ne	20	Thorium	Th	232.5
COBALT	Co	59.0	Nickel	Ni	58.7	*Thulium*	Tm	171
Columbium	Cb	94	Nitrogen	N	14.04	TIN	Sn	119.0
Copper	Cu	63.6	*Osmium*	Os	191	*Titanium*	Ti	48.1
Erbium	Er	166	OXYGEN	O	16	TUNGSTEN	W	184.0
Fluorine	F	19	Palladium	Pd	106.5	Uranium	U	238.5
Gadolinium	Gd	156	PHOSPHORUS	P	31.0	Vanadium	V	51.2
Gallium	Ga	70	Platinum	Pt	194.8	*Xenon*	Xe	128
Germanium	Ge	72.5	Potassium	K	39.15	YTTERBIUM	Yb	173.0
Glucinum	Gl	9.1	Praseodymium	Pr	140.5	YTTRIUM	Yt	89.0
Gold	Au	197.2	*Radium*	Rd	225	Zinc	Zn	65.4
Helium	He	4	RHODIUM	Rh	103.0	Zirconium	Zr	90.6

TABLE OF COMPARATIVE PLATE SPEED NUMBERS

H & D	Watkins P No.	Wynne F No.	H & D	Watkins P No.	Wynne F No.
10	15	24	220	323	114
20	30	28	240	352	120
40	60	49	260	382	124
80	120	69	280	412	129
100	147	77	300	441	134
120	176	84	320	470	138
140	206	91	340	500	142
160	235	103	380	558	150
200	294	109	400	588	154

The above Watkins and Wynne numbers are equivalent to the H and D, only when the latter is determined in accordance with the directions of Hurter and Driffield, that is with pyro-soda developer and using the straight portion only of the density curve.

To convert H and D into Watkins: Multiply H and D by 50 and divide by 34. For all practical purposes the Watkins P number is 1½ times H and D.

To convert Watkins into Wynne F Nos.: Extract the square root and multiply by 6.4.

The above methods have been approved by the Watkins Meter Company and the Infallible Exposure Meter Company.

TABLES OF DISTANCES AT AND BEYOND WHICH ALL OBJECTS ARE IN FOCUS WHEN SHARP FOCUS IS SECURED ON INFINITY

Focal length of Lens in inches	Ratio marked on Stops													
	f/4	f/5.6	f/6	f/7	f/8	f/10	f/11	f/15	f/16	f/20	f/22	f/32	f/44	f/6
	Number of feet after which all is in focus													
4	33	24	22	19	17	13	12	9	8	7	6	4	3	2
4¼	38	27	25	21	19	15	14	10	10	7	7	5	3½	2½
4½	42	30	28	24	21	17	15	11	11	8½	7½	5½	4	3
4¾	47	34	31	27	24	19	17	12	12	9½	8½	6	5	3
5	52	36	35	30	26	21	19	14	13	10½	9½	6½	5½	3½
5¼	57	40	38	33	28	23	21	15	14	11½	10½	7	5½	3½
5½	63	45	43	36	31	25	23	17	15	12½	11½	7½	6	4
5¾	68	50	46	38	34	27	25	18	17	13½	13	8½	6½	4
6	75	54	50	42	38	30	28	20	19	15	14	9	7	4½
6¼	81	58	54	46	40	32	29	22	20	16	15	10	7½	5
6½	87	62	58	50	44	35	32	23	22	17½	16	11	8	5½
6¾	94	67	63	54	47	38	34	25	24	19	17	12	8½	6
7	101	72	68	58	51	40	37	27	25	20	18	12½	9	6
7¼	109	78	73	62	54	44	39	29	27	22	20	13½	10	6½
7½	117	83	78	64	58	47	42	31	29	24	21	14½	10½	7
7¾	124	90	83	71	62	50	45	33	31	25	22	15½	11	7½
8	132	96	88	76	68	52	48	36	32	28	24	16	12	8
8¼	141	100	94	80	71	56	51	37	35	29	25	17½	12½	8½
8½	150	104	100	84	76	60	56	40	38	30	27	19	13½	9
8¾	156	111	104	89	78	63	57	42	39	32	29	20	14	10
9	168	120	112	96	84	67	61	45	42	34	31	21	15	10½
9¼	180	127	116	101	90	71	65	47	45	35	32	22	16	11
9½	190	133	125	107	95	75	68	50	47	37	34	24	17	12
9¾	197	141	131	113	99	79	72	52	50	39	36	25	18	12½
10	208	148	140	120	104	83	75	55	52	42	38	26	19	13

If sharp focus is secured on any of the distances shown, then, with the stop indicated all objects are in focus from half the distance focused on up to infinity.

LENGTH OF STUDIO

REQUIRED FOR LENSES OF DIFFERENT FOCAL LENGTHS FROM 6 TO 8 FEET IS ALLOWED FOR THE CAMERA AND OPERATOR

From "Photographic Lenses" by BECK and ANDREWS

Focus of Lens	Size	Kind of Portrait	Length of Studio	Dist. of Lens from Object
Inches			In Feet	In Feet
6	Carte de Visite 3¼x4¼	Full Length	18 to 20	11 to 12
7½	Carte de Visite	Full Length	22 to 25	14 to 15
8½	Carte de Visite	Full Length	24 to 28	17 to 19
		Bust	10 to 15	5
9½	Cabinet and smaller groups	Full Length	20 to 23	12 to 13
		Bust	12 to 17	7
11	Cabinet and 5x7 groups	Full Length	25 to 30	17 to 18
		Bust	13 to 20	8
14½	Cabinets, panels and 6½x8½ groups	Full Length	32 to 40	23 to 24
		Bust	14 to 20	7
19	10x12 portraits or groups	Full Length	20 to 25	13
		Bust	14 to 20	7
24	16x20 portraits or groups	Full Length	25 to 30	14
		Bust	14 to 20	8

TABLE FOR CALCULATING DISTANCES IN ENLARGING OR REDUCING

From The British Journal Photographic Almanac

Focus of Lens	Times of Enlargement and Reduction							
Inches	1 Inch	2 Inches	3 Inches	4 Inches	5 Inches	6 Inches	7 Inches	8 Inches
2.....	4 4	6 3	8 2⅔	10 2½	12 2⅖	14 2⅓	16 2 2/7	18 2¼
2½.....	5 5	7½ 3¾	10 3⅓	12½ 3⅛	15 3	17½ 2 9/10	20 2 6/7	22½ 2 13/16
3.....	6 6	9 4½	12 4	15 3¾	18 3⅗	21 3½	24 3 3/7	27 3⅜
3½.....	7 7	10½ 5¼	14 4⅔	17½ 4⅜	21 4⅕	24½ 4 1/12	28 4	31½ 3 9/10
4.....	8 8	12 6	16 5⅓	20 5	24 4⅘	28 4⅔	32 4 4/7	36 4½
4½.....	9 9	13½ 6¾	18 6	22½ 5⅝	27 5⅖	31½ 5¼	36 5 1/7	40½ 5 1/16
5.....	10 10	15 7½	20 6⅔	25 6¼	30 6	35 5⅚	40 5 5/7	45 5⅝
5½.....	11 11	16½ 8¼	22 7⅓	27½ 6 4/5	33 6½	38½ 6 5/12	44 6 2/7	49½ 6 3/16
6.....	12 12	18 9	24 8	30 7½	36 7⅕	42 7	48 6 6/7	54 6¾
7.....	14 14	21 10½	28 9⅓	35 8¾	42 8⅖	49 8⅛	56 8	63 7⅞
8.....	16 16	24 12	32 10⅔	40 10	48 9 4/5	56 9⅓	64 9 1/7	72 9
9.....	18 18	27 13½	36 12	45 11¼	54 10 4/5	63 10½	72 10 2/7	81 10⅛

The object of this table is to enable any manipulator who is about to enlarge (or reduce) a copy any given number of times to do so without troublesome calculation. It is assumed that the photographer knows exactly what the focus of his lens is, and that he is able to measure accurately from its optical center. The use of the table will be seen from the following illustration: A photographer has a *carte* to enlarge to four times its size, and the lens he intends employing is one of 6 inches equivalent focus. He must therefore look for 4 on the upper horizontal line and for 6 on the first vertical column and carry his eye to where these two join, which will be 30–7½. The greater of these is the distance the sensitive plate must be from the center of the lens; and the lesser, the distance of the picture to be copied. To *reduce* a picture any given number of times, the same method must be followed; but in this case the greater number will represent the distance between the lens and the picture to be copied, the latter that between the lens and the sensitive plate. This explanation will be sufficient for every case of enlargement or reduction.

If the focus of the lens be 12 inches, as this number is not in the column of focal lengths, look out for 6 in this column and multiply by 2, and so on with any other numbers.

UNITED STATES WEIGHTS AND MEASURES
According to Existing Standards

LINEAR

	Inches	Feet	Yards	Rods	Fur's	Mi.
12 inches = 1 foot.	12	= 1				
3 feet = 1 yard	36	= 3	= 1			
5.5 yards = 1 rod.	198	= 16.5	= 5.5	= 1		
40 rods = 1 furlong.	7,920	= 660	= 220	= 40	= 1	
8 furlongs = 1 mile.	63,360	= 5,280	= 1,760	= 320	= 8	= 1

SURFACE—LAND

	Feet	Yards	Rods	Roods	Acres
144 sq. ins. = 1 sq. ft.					
9 sq. ft. = 1 sq. yard.	9	= 1			
30.25 sq. yds. = 1 sq. rod.	272.25	= 30.25	= 1		
40 sq. rods = 1 sq. rood.	10,890	= 1,210	= 40	= 1	
4 sq. roods = 1 acre.	43,560	= 4,840	= 160	= 4	= 1
640 acres = 1 sq. mile.	27,878,400	= 3,097,600	= 102,400	= 2,560	= 640

VOLUME—LIQUID

	Gills.	Pints.	Gallon.	Cub.In
4 gills = 1 pint.	32	= 8	= 1	= 231
2 pints = 1 quart.				
4 quarts = 1 gallon.				

FLUID

Gallon	Pints	Ounces	Drachms	Minims	Cubic Centimetres
1	= 8	= 128	= 1,024	= 61,440	= 3,785,435
	1	= 16	= 128	= 7,680	= 473,179
		1	= 8	= 480	= 29,574
			1	= 60	= 3,697

16 ounces, or a pint, is sometimes called a fluid pound.

TROY WEIGHT

Pound	Ounces	Pennyweights	Grains	Grams
1	= 12	= 240	= 5,760	= 373.24
	1	= 20	= 480	= 31.10
		1	= 24	= 1.56

APOTHECARIES' WEIGHT

lb. Pound	℥ Ounces	ʒ Drachms	℈ Scruples	gr. Grains	Grams
1	= 12	= 96	= 288	= 5,760	= 373.24
	1	= 8	= 24	= 480	= 31.10
		1	= 3	= 60	= 3.89
			1	= 20	= 1.30
				1	= .06

The pound, ounce, and grain are the same as in Troy weight.

AVOIRDUPOIS WEIGHT

Pound	Ounces	Drachms	Grains (Troy)	Grams
1	= 16	= 256	= 7,000	= 453.60
	1	= 16	= 437.5	= 28.35
		1	= 27.34	= 1.77

ENGLISH WEIGHTS AND MEASURES

APOTHECARIES' WEIGHT

20 Grains	=	1 Scruple	=	20 Grains.
3 Scruples	=	1 Drachm	=	60 Grains.
8 Drachms	=	1 Ounce	=	480 Grains.
12 Ounces	=	1 Pound	=	5,760 Grains.

FLUID MEASURE

60 Minims	=	1 Fluid Drachm
8 Drachms	=	1 Fluid Ounce.
20 Ounces	=	1 Pint.
8 Pints	=	1 Gallon.

The above weights are usually adopted in formulas.

All Chemicals are usually sold by

AVOIRDUPOIS WEIGHT

27 11/32 Grains	=	1 Drachm	=	27 11/32 Grains.
16 Drachms	=	1 Ounce	=	437½ Grains.
16 Ounces	=	1 Pound	=	7,000 Grains.

Precious Metals are usually sold by

TROY WEIGHT

24 Grains	=	1 Pennyweight	=	24 Grains.
20 Pennyweights	=	1 Ounce	=	480 Grains.
12 Ounces	=	1 Pound	=	5,760 Grains.

Note.—An ounce of metallic silver contains 480 grains, but an ounce of nitrate of silver contains only 437½ grains.

UNITED STATES FLUID MEASURE

Gal.		Pints.		Ounces.		Drachms.		Mins.		Cub. In.		Grains.		Cub. C. M.
1	=	8	=	128	=	1,024	=	61,440	=	231.	=	58,328.886	=	3,785.44
		1	=	16	=	128	=	7,680	=	28.875	=	7,291.1107	=	473.18
				1	=	8	=	480	=	1.8047	=	455.6944	=	29.57
						1	=	60	=	0.2256	=	56.9618	=	3.70

IMPERIAL BRITISH FLUID MEASURE

Gal.		Pints.		Ounces.		Drachms.		Mins.		Cub. In.		Grains.		Cub. C. M.
1	=	8	=	160	=	1,280	=	76,800	=	277.27384	=	70,000	=	4,543.732
		1	=	20	=	160	=	9,600	=	34.65923	=	8,750	=	567.966
				1	=	8	=	480	=	1.73296	=	437.5	=	28.398
						1	=	60	=	0.21662	=	54.69	=	3.550

METRIC SYSTEM OF WEIGHTS AND MEASURES

MEASURES OF LENGTH

Denominations and Values		Equivalents in Use	
Myriameter	10,000 meters.	6.2137	miles.
Kilometer	1,000 meters.	.62137	mile, or 3,280 ft. 10 ins.
Hectometer	100 meters.	328.	feet and 1 inch.
Dekameter	10 meters.	393.7	inches.
Meter	1 meter.	39.37	inches.
Decimeter	1-10th of a meter.	3.937	inches.
Centimeter	1-100th of a meter.	.3937	inch.
Millimeter	1-1000th of a meter.	.0394	inch.

MEASURES OF SURFACE

Denominations and Values		Equivalents in Use	
Hectare	10,000 square meters.	2.471	acres.
Are	100 square meters.	119.6	square yards.
Centare	1 square meter.	1,550.	square inches.

MEASURES OF VOLUME

Denominations and Values			Equivalents in Use			
Names	No. of Liters	Cubic Measures	Dry Measure		Wine Measure	
Kiloliter or stere	1,000	1 cubic meter.	1.308	cubic yards.	264.17	gallons.
Hectoliter	100	1-10th cubic meter.	2	bu. and 3.35 pecks.	26.417	gallons.
Dekaliter	10	10 cubic decimeters.	9.08	quarts.	2.6417	gallons.
Liter	1	1 cubic decimeter.	.908	quart.	1.0567	quarts.
Deciliter	1-10	1-10th cubic decimeter.	6.1023	cubic inches	.845	gill.
Centiliter	1-100	10 cubic centimeters.	.6102	cubic inch.	.338	fluid oz.
Milliliter	1-1000	1 cubic centimeter.	.061	cubic inch.	.27	fl. drm.

WEIGHTS

Denominations and Values			Equivalents in Use	
Names	Number of Grams	Weight of Volume of Water at its Maximum Density	Avoirdupois Weight	
Millier or Tonneau	1,000,000	1 cubic meter.	2204.6	pounds.
Quintal	100,000	1 hectoliter.	220.46	pounds.
Myriagram	10,000	10 liters.	22.046	pounds.
Kilogram or Kilo	1,000	1 liter.	2.2046	pounds.
Hectogram	100	1 deciliter.	3.5274	ounces.
Dekagram	10	10 cubic centimeters.	.3527	ounce.
Gram	1	1 cubic centimeter.	15.432	grains.
Decigram	1-10	1-10th of a cubic centimeter.	1.5432	grain.
Centigram	1-100	10 cubic millimeters.	.1543	grain.
Milligram	1-1000	1 cubic millimeter.	.0154	grain.

For measuring surfaces, the square dekameter is used under the term of ARE; the hectare, or 100 ares, is equal to about 2½ acres. *The unit of capacity* is the cubic decimeter or LITER, and the series of measures is formed in the same way as in the case of the table of lengths. The cubic meter is the unit of measure for solid bodies, and is termed STERE. *The unit of weight* is the GRAM, which is the weight of one cubic centimeter of pure water weighed in a vacuum at the temperature of 4 deg. Cent. or 39.2 deg. Fahr., which is about its temperature of maximum density. In practice, the term cubic centimeter, abbreviated c.c., is generally used instead of milliliter, and cubic meter instead of kiloliter.

THE CONVERSION OF FRENCH (METRIC) INTO ENGLISH MEASURE

1	cubic centimeter	=	17	minims						
1	cubic centimeters	=	34	"						
3	"	=	51	"						
4	"	=	68	"	or	1	dram	8	minims	
5	"	=	85	"	"	1	"	25	"	
6	"	=	101	"	"	1	"	41	"	
7	"	=	118	"	"	1	"	58	"	
8	"	=	135	"	"	2	drams	15	"	
9	"	=	152	"	"	2	"	32	"	
10	"	=	169	"	"	2	"	49	"	
20	"	=	338	"	"	5	"	38	"	
30	"	=	507	"	"	1	ounce	0	dram	27 minims
40	"	=	676	"	"	1	"	3	drams	16 "
50	"	=	845	"	"	1	"	6	"	5 "
60	"	=	1014	"	"	2	ounces	0	"	54 "
70	"	=	1183	"	"	2	"	3	"	43 "
80	"	=	1352	"	"	2	"	6	"	32 "
90	"	=	1521	"	"	3	"	1	"	21 "
100	"	=	1690	"	"	3	"	4	"	10 "
1000	"	=	1 liter = 34 fluid ounces nearly, or 2⅛ pints.							

THE CONVERSION OF FRENCH (METRIC) INTO ENGLISH WEIGHT

The following table, which contains no error greater than one-tenth of a grain, will suffice for most practical purposes:

1	gram	=	15⅖	grains.					
2	grams	=	30⅘	"					
3	"	=	46⅕	"					
4	"	=	61⅘	"	or	1	dram	1⅘	grain.
5	"	=	77⅕	"	 "	1	"	17⅕	grains
6	"	=	92⅖	"	 "	1	"	32⅖	"
7	"	=	108	"	 "	1	"	48	"
8	"	=	123⅖	"	 "	2	drams	3⅖	"
9	"	=	138⅘	"	 "	2	"	18⅘	"
10	"	=	154⅖	"	 "	2	"	34⅖	"
11	"	=	169⅘	"	 "	2	"	49⅘	"
12	"	=	185⅕	"	 "	3	"	5⅕	"
13	"	=	200⅖	"	 "	3	"	20⅖	"
14	"	=	216	"	 "	3	"	36	"
15	"	=	231⅖	"	 "	3	"	51⅖	"
16	"	=	247	"	 "	4	"	7	"
17	"	=	262⅖	"	 "	4	"	22⅖	"
18	"	=	277⅘	"	 "	4	"	37⅘	"
19	"	=	293⅕	"	 "	4	"	53⅕	"
20	"	=	308⅖	"	 "	5	"	8⅖	"
30	"	=	463	"	 "	7	"	43	"
40	"	=	617⅕	"	 "	10	"	17⅕	"
50	"	=	771⅖	"	 "	12	"	51⅖	"
60	"	=	926	"	 "	15	"	26	"
70	"	=	1080⅕	"	 "	18	"	0⅕	"
80	"	=	1234⅖	"	 "	20	"	34⅖	"
90	"	=	1389	"	 "	23	"	9	"
100	"	=	1543⅕	"	 "	25	"	43⅕	"
1000	"	=	1 kilogram = 32 oz., 1 dr., 12⅖ gr						

"UNIFORM SYSTEM" NUMBERS FOR STOPS FROM $\frac{f}{1}$ TO $\frac{f}{100}$

In the following table Mr. S. A. Warburton calculated the exposure necessary with every stop from $\frac{f}{1}$ to $\frac{f}{100}$ compared with the unit stop of the "uniform system" of the Photographic Society of Great Britain. The figures which are underlined show in the first column what $\frac{f}{a}$ must be in order to increase the exposure in geometrical ratio from $\frac{f}{1}$, the intermediate numbers showing the uniform system number for any other aperture

f	U. S. No.	f	U. S. No.	f	U. S. No.
1	1/16	15	14.06	58	210.25
1¼	.097	16	16	59	217.56
1.414	½	17	18.06	60	225.00
1½	.140	18	20.25	61	232.56
1¾	.191	19	22.56	62	240.25
2	¼	20	25.00	63	248.06
2¼	.316	21	27.56	64	256
2½	.390	22	30.25	65	264.06
2.828	½	22.62	32	66	272.25
2¾	.472	23	33.06	67	280.56
3	.562	24	36.00	68	289.00
3¼	.660	25	39.06	69	297.56
3½	.765	26	42.25	70	306.25
3¾	.878	27	45.56	71	15.06
4	1	28	49.00	72	324.00
4¼	1.12	29	52.56	73	333.06
4½	1.26	30	56.25	74	342.25
4¾	1.41	31	60.06	75	351.56
5	1.56	32	64	76	361.00
5¼	1.72	33	68.06	77	370.56
5½	1.89	34	72.25	78	380.25
5.656	2	35	76.56	79	390.06
5¾	2.06	36	81.00	80	400.00
6	2.25	37	85.56	81	410.06
6¼	2.44	38	90.25	82	420.25
6½	2.64	39	95.06	83	430.56
6¾	2.84	40	100.00	84	440.00
7	3.06	41	105.06	85	451.56
7¼	3.28	42	110.25	86	462.25
7½	3.51	43	115.56	87	473.06
7¾	3.75	44	121.00	88	484.00
8	4	45	126.56	89	495.06
8¼	4.25	45.25	128	90	506.25
8½	4.51	46	132.25	90.50	512
8¾	4.78	47	138.06	91	517.56
9	5.06	48	144.00	92	529.00
9¼	5.34	49	150.06	93	540.56
9½	5.64	50	156.25	94	552.25
9¾	5.94	51	162.56	95	564.06
10	6.25	52	169.00	96	576.00
11	7.56	53	175.56	97	588.06
11.31	8	54	182.25	98	600.25
12	9.00	55	189.06	99	612.56
13	10.56	56	196.00	100	625
14	12.25	57	203.06		

American Photographic Societies

This list is compiled from information received from an inquiry form sent to over one hundred societies during the latter half of 1912. It includes many societies not given in the 1912 list, but falls short of completeness as a record of the photographic societies of America. Secretaries of societies not here listed are urged to send us particulars of their organizations so that the list may be fully representative of society activities.—Editor.

AKRON CAMERA CLUB—Akron, Ohio. Headquarters, Y. M. C. A. Building. Established 1890. Membership, 50. Date of meetings, second and fourth Monday of each month from October to May, inclusive. *President*, H. A. Hoffman; *Secretary*, A. S. Hibbs, 358 Dean Street. Date of annual exhibition, February.

AMERICAN FEDERATION OF PHOTOGRAPHIC SOCIETIES—Headquarters, Toledo Museum of Art, Toledo, Ohio. *President*, John F. Jones, 723 Ash Street, Toledo, Ohio; *Vice-President*, August Smith, Toledo, Ohio; *Treasurer*, George W. Beatty; *Secretary*, C. C. Taylor, 3223 Cambridge Avenue; *Historian*, William A. Rheinheimer. For the advancement of pictorial photography, encouragement of pictorial workers and development of new talent. To hold an annual national Salon, of the highest class, to be exhibited in the principal American Art Museums and art centres.

AMERICAN INSTITUTE PHOTOGRAPHIC SECTION—New York City. Headquarters, 19-21 West 44th Street. Established March 26, 1859. Stated meetings, first and third Tuesdays of each month. No meetings during Summer months. *President*, Oscar G. Mason; *Vice-President*, Robert A. B. Dayton; *Treasurer*, James Y. Watkins; *Secretary*, John W. Bartlett, M.D., F.R.P.S., 149 West 94th Street.

AMERICAN LANTERN SLIDE INTERCHANGE—New York. Principal office, 361 Broadway. Organized 1885. *General Manager*, F. C. Beach. Membership, 20 clubs. *Board of Managers*, F. C. Beach, New York; H. W. Shonewolf, Buffalo, N. Y.; O. C. Reiter, Pittsburg, Pa.; H. R. Terhune, Orange, N. J.; W. H. Rau, Philadelphia, Pa. Annual meeting, January of each year.

BALTIMORE CAMERA CLUB, INC.—Headquarters, 1121 Bolton Street, Baltimore, Md. Organized in April, 1912. *President*, Jas. Leslie Hays; *Vice-President*, Enoch M. Barker; *Secretary*, Geo. E. Kessell, 113 North Charles Street; *Treasurer*, John Douglas Wade. Meet every Friday night.

BOSTON CAMERA CLUB—Boston, Mass. Headquarters, 50 Bromfield Street. Established 1881. Incorporated 1886. Membership, 100. Date of meetings, first Mondays. *President*, P. Hubbard; *Secretary*, John H. Thurston, 50 Bromfield Street. Date of annual exhibition, Spring.

BOSTON PHOTO-CLAN—Boston, Mass. Organized July, 1911. Headquarters, The Garo Studio, 747 Boylston Street. Membership, 9. *Secretary*, Dr. Malcolm Dean Miller, 419 Boylston Street, Brookline, Mass.

BOSTON YOUNG MEN'S CHRISTIAN UNION CAMERA CLUB—Boston, Mass. Headquarters, 48 Boylston Street, Boston. Organized 1908. *President*, Dr. H. D. Hutchins; *Vice-President*, Arthur Hammond; *Treasurer*, H. C. Channen; *Secretary*, M. L. Vincent. Meetings first Tuesday each month at club rooms, 48 Boylston Street.

BUFFALO CAMERA CLUB—Buffalo, N. Y. Headquarters, Block Building, corner Elmwood Avenue and Utica Street. Annual election of officers fourth Thursday in April; regular meeting nights, second and fourth Thursdays of each month. *President*, Chas. R. Phipps; *Vice-President*, E. I. McPhail; *Secretary*, John L. Garretson, 364 West Delavan Avenue.

CALIFORNIA CAMERA CLUB—San Francisco, Cal. Headquarters, 833 Market Street, San Francisco. Established March 18, 1890. Incorporated April 5, 1890. Membership, 369. Date of meeting, second Tuesday, monthly. Date of annual exhibition, no set time. *President*, Edward H. Kemp; *Secretary*, C. Willard Evans, 833 Market Street, San Francisco, Cal.

CAMERA CLUB—New York. Headquarters, 121 West 68th Street. Established by consolidation of Society of Amateur Photographers and New York Camera Club in April, 1896. Incorporated May 7, 1896. Membership, 200. Date of annual meeting, first Thursday after the first Monday in January. *Secretary,* Monroe W. Tingley.

CAMERA CLUB OF HARTFORD—Hartford, Conn. Membership, 25. *President,* Dr. Frederic S. Crossfield, 75 Pratt Street; *Vice-President,* Clayton P. Chamberlain; *Corresponding Secretary,* Eugene D. Field; *Treasurer,* A. L. Chase; *Secretary,* Mr. Charles R. Nason, 20 Madison Street.

CAMERA CLUB OF THE TWENTY-THIRD STREET BRANCH, Y. M. C. A.—New York. Headquarters, 23d Street Y. M. C. A. Established June 3, 1904. Membership, 65. Date of business meetings, first Monday in each month; third Monday in each month, socials, lantern slide lectures, etc. *President,* Ernest Adams; *Secretary,* J. O. Sprague, 215 West 23d Street; *Treasurer,* Edwin Miller. Date of annual exhibition, usually in January. No fixed date.

"CAMERADS"—New Brunswick, N. J. Headquarters, corner Church and George Streets. Established April 24, 1890. *Secretary,* Harvey Iredell, D.D.S., Lock Box 34, New Brunswick.

CAPITAL CAMERA CLUB—Washington, D. C. Headquarters, 1010 F Street, N. W. Established April, 1891. Date of meetings, second Friday in each month. *President,* Wm. T. Wade; *Vice-President,* Wm. Ullman; *Treasurer,* Louis Lowe; *Secretary,* R. D. Vail, 1010 F Street, N. W.; *Librarian,* W. C. Babcock. Date of annual exhibition, May.

CHICAGO CAMERA CLUB—Chicago, Ill. Headquarters, 329 Plymouth Court. Established February 14, 1904. Incorporated February 19, 1904. Date of meetings, every Thursday. *President,* George C. McKee; *Vice-President,* Frank T. Farrell; *Secretary* and *Treasurer,* Thos. C. Kiely, 329 Plymouth Court.

COLUMBIA PHOTOGRAPHIC SOCIETY—Philadelphia, Pa. Headquarters, 2526 North Broad Street, Philadelphia. Established 1889. Incorporated July 3, 1894. Membership, 100. Date of meetings, first Monday of each month, business meeting; other Mondays, lectures or demonstrations. *President,* Ed Ramsey; *Secretary,* J. V. Alteneder, 2526 North Broad Street, Philadelphia. Date of annual exhibition, January, prints; November, lantern slide.

COLUMBUS PHOTO-PICTORIALISTS—Columbus, Ohio. Headquarters, 20 East Broad Street. Established May 10, 1910. Membership, 50. Incorporated February 12, 1912. *President,* A. L. Kidd; *Vice-President,* J. W. Newton; *Secretary* and *Treasurer,* C. L. McKibben, 44 East Broad Street.

DAGUERRE CAMERA CLUB—Headquarters, Harbert, Mich. Established 1893. Membership, 20. Date of meetings, first Monday of each month. *President,* F. Blish; *Secretary,* Wells Sizer, Harbert.

ELMIRA CAMERA CLUB—Elmira, N. Y. Headquarters, 112 Baldwin Street, Elmira. Established 1902. Membership, 36. *President,* W. E. Bryan; *Secretary-Treasurer,* Seely Stage, 217 Sullivan Street.

ELYSIAN CAMERA CLUB—Hoboken, N. J. Headquarters, 307 Washington Street. Established 1902. Date of meetings, second Friday of each month. Membership, 50. *President,* Conrad R. Pederson; *Vice-President,* Chas. F. A. Hall; *Treasurer,* Julius Nelson; *Secretary,* Charles Westerburg, 636 Park Avenue.

ESSEX CAMERA CLUB—Newark, N. J. Headquarters, 33 Court Street, Newark, N. J. Organized July, 1899. Membership, 80. Date of meetings, fourth Tuesday of every month. *President,* Floyd V. Harper; *Secretary,* L. F. Gebhardt, 233 South 11th Street. Date of annual exhibition, February.

GRAND RAPIDS CAMERA CLUB—Grand Rapids, Mich. *President,* Dr. W. A. Rawson; *Vice-President,* H. M. Long; *Secretary-Treasurer,* Miss Fedora E. D. Brown.

HAMILTON SCIENTIFIC ASSOCIATION, CAMERA SECTION—Hamilton, Can. Headquarters, 104 King Street, W. Established April, 1891. Membership, 80. Date of meetings, second and fourth Mondays. *President,* T. H. Wingham; *Secretary,* Sinclair G. Richardson, 401 Bank of Hamilton Building. Date of annual exhibition, last week of March.

HAVERHILL CAMERA CLUB—Haverhill, Mass. Headquarters, Exchange Block, Water Street. Established 1898. Membership, 37 active, 1 honorary. Date of meetings, third Tuesday, monthly. *President,* Joseph Osgood; *Secretary,* Geo. W. Nutter, Central Street; *Treasurer,* Vard B. Leavitt. Date of annual exhibition, no set date. Usually in March.

INTERNATIONAL PHOTOGRAPHIC ASSOCIATION—San Francisco, Cal. Founded 1908. *President,* F. B. Hinman, Room 4, Union Depot, Denver, Colo.; *Chief Album Director,* J. H. Winchell, R. F. D. No. 2, Painesville, Ohio; *General Secretary,* Fayette J. Clute, 413-415 Call Building, San Francisco; *Stereoscopic Album Director,* Harry Gordon Wilson, 4954 Washington Avenue, Chicago, Ill.; *Director Post Card Division,* Charles M.

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JAMESTOWN CAMERA CLUB—Jamestown, N. Y. Established 1907. Headquarters, Arcade Building, Jamestown, N. Y. Membership, 27. Meetings, second Tuesday of month. *President*, L. C. Ogren; *Vice-President*, C. O. Hultgren; *Treasurer*, E. H. Sample; *Secretary*, Louis Miller, 214 Fulton Street; *Asst. Secretary*, C. P. Moore.

LENS AND BRUSH CLUB—Northampton, Mass. Headquarters, Y. M. C. A. Building. Organized 1906. Meetings, second Thursday in month. Exhibition usually in early June. *President*, C. H. Sawyer; *Vice-President*, C. H. Howard; *Secretary*, C. Norman Fitts, 12 Bedford Terrace.

LOS ANGELES CAMERA CLUB—Los Angeles, Cal. Headquarters, 3d floor, 321 South Hill Street. Meet every Thursday at 8 p. m. Organized 1908. *President*, R. S. Crandall; *Secretary*, T. K. Adlard, 1104 West 42d Street.

MISSOURI CAMERA CLUB—St. Louis, Mo. Club Rooms, Suite No. 26 and 27, Euclid Building. Organized November, 1903. Meetings, second and fourth Tuesday. *President*, Edwin Loker; *Secretary*, Arnold D. Alb, 3819 West Pine Street; *Treasurer, Chas. Lindenschmit.*

MONTREAL AMATEUR ATHLETIC ASSOCIATION CAMERA CLUB—Montreal, Canada. Headquarters, M. A. A. A. Building, 250 Peel Street. Organized May 1, 1906. *President*, W. R. Allen; *Vice-President*, P. S. Robinson; *Treasurer*, R. E. Melville; *Secretary*, B. B. Pinkerton, 55 Trafalgar Avenue.

NEWARK CAMERA CLUB—59 Mechanic Street, Newark, N. J. Organized 1888. Incorporated 1910. *President*, F. Oscar Race; *Vice-President*, Alexander Berne; *Treasurer*, L. Wright, Jr.; *Secretary*, W. S. Norris, 85 Bleecker Street, Newark, N. J.

NEW BRITAIN CAMERA CLUB—Organized 1892. *President*, H. E. Voight; *Secretary*, E. A. Sheldon, 53 Lenox Place, New Britain, Conn. Meets second and fourth Tuesdays, 173 Main Street.

ORANGE CAMERA CLUB—Orange, N. J. Headquarters, 222 Main Street. Established March 21, 1892. Incorporated May 19, 1893. Membership, 100. Date of meetings, first and third Saturdays of each month, except July, August and September. *President*, Dr. John L. Adams; Secretary, George P. Lester, 222 Main Street, Orange, N. J.

OREGON CAMERA CLUB—Portland, Ore. Established 1895. Incorporated 1903. Headquarters, 207 Park Street. Membership, 150. Date of meetings, second Tuesday in January. *President*, Henry Berger, Jr.; *Vice-President*, B. S. Durkee; *Secretary*, L. E. Anderson; *Treasurer*, F. W. Donnerberg. Date of annual exhibition, early Spring.

PHOTOGRAPHIC CLUB OF BALTIMORE CITY—Baltimore, Md. Headquarters, Maryland Academy of Sciences Building, 105 West Franklin Street. Established 1885. Incorporated 1890. Membership—Active, 37; honorary, 7; associate, 4; non-resident, 1. Total, 49. Date of meetings, every Tuesday, 8:30 p. m. *President*, J. F. Ferguson; *Secretary*, Geo. H. Rowe, 21 West Fayette Street. Date of annual exhibition, February.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA—Philadelphia, Pa. Headquarters, 1722 Arch Street. Established November, 1862. Incorporated April 24, 1885. Membership, 134. Date of meetings, second and third

Wednesdays, 8 p. m. *President*, C. Yarnall Abbott; *Secretary*, Edward H. Smith, 1722 Arch Street. Date of annual exhibition, February.

PHOTO-PICTORIALISTS OF BUFFALO—Buffalo, N. Y. Organized October, 1906. Membership, 8. Meetings, semi-monthly. *Correspondent*, W. H. Porterfield, 100 Lakeview Avenue.

PHOTO-SECESSION—New York, N. Y. Headquarters and Galleries, 291 Fifth Avenue. Continuous exhibitions November-April. *Director*, Alfred Stieglitz.

PITTSBURG ACADEMY OF SCIENCE AND ART (PHOTOGRAPHIC SECTION)—Pittsburg, Pa. Headquarters, Carnegie Institute, Schenley Park. Organized January 23, 1900. Membership, 100. Meetings, second Tuesday of each month at Club Room, 6004 Penn Avenue, and fourth Tuesday of each month at Carnegie Institute. *President*, O. C. Reiter, 2424 Penn Avenue; *Vice-President*, Rev. David R. Breed; *Secretary-Treasurer*, F. L. Miller, 1113 Union Station; *Lantern Slide Director*, F. C. Wilharm, 535 Winfield Street; *Print Director*, S. A. Martin.

PITTSBURG CAMERA CLUB—Pittsburg, Pa. Established December, 1910. Membership, 75. Headquarters, 233 Fifth Avenue. *President*, Geo. W. Laying; *Treasurer*, Wm. McK. Ewart, 2524 Center Avenue; *Secretary*, George B. Parker, 426 Diamond Street.

PORTLAND CAMERA CLUB PHOTOGRAPHIC SECTION OF THE PORTLAND SOCIETY OF ART—Portland, Me. Headquarters, Spring corner High Street. Established 1899. Membership, 90. Date of meetings, every Monday evening. *President*, O. P. T. Wish; *Vice-President*, F. W. Shaw; *Secretary*, E. Roy Monroe. Date of annual exhibition, in March.

POSTAL PHOTOGRAPHIC CLUB—Headquarters, Washington, D. C. Established December, 1888. Membership, 40. Date of meetings, no regular meeting. *President*, Charles E. Fairman; *Secretary*, Gustavus A. Brandt, 631 Maryland Avenue, S. W., Washington, D. C. Albums circulate among members monthly, except August and September.

PROVIDENCE CAMERA CLUB—Providence, R. I. Established 1883. Incorporated 1889. Headquarters, Commercial Building, 55 Eddy Street. Total membership, 100. Date of meetings, second Saturday of each month. *President*, C. W. Morrill; *Vice-President*, C. S. Westcott; *Secretary*, H. Ladd Walford, 55 Eddy Street; *Treasurer*, Homer Winslow.

ROCHESTER CAMERA CLUB—Rochester, N. Y. Headquarters, Wilder Arcade, Rochester, N. Y. *President*, Niel G. Macneill; *Vice-President*, Arthur Ramsey; *Secretary-Treasurer* W. Edgar Tounley, 17 Dover Street.

SALON CLUB—Thirty members. *Director*, W. H. Zerbe, 345 Spruce Street, Richmond Hill, L. I., N. Y.; *Secretary*, Miss Katherine Bingham, St. Johnsbury, Vt. Circulate monthly portfolios.

ST. LAWRENCE CAMERA CLUB—Ogdensburg, N. Y. Headquarters, 26 Jay Street. Established 1900. Membership, 7. Date of meetings, at the call of the Secretary. *President*, Arthur L. Jameson; *Secretary*, John N. Brown, 26 Jay Street.

ST. LOUIS R. R. Y. M. C. A. CAMERA CLUB—St. Louis, Mo. Headquarters, 20th and Eugenia Streets. Meetings, second and fourth Thursdays of each month. *President*, P. B. Speed; *Vice-President*, O. C. Kuehn; *Secretary* and *Treasurer*, O. C. Keil, 1201 Wabash Ave.

SYRACUSE CAMERA CLUB—Syracuse, N. Y. Headquarters, Y. M. C. A. Building. Established 1886. Incorporated January 19, 1892. Membership, 101. Date of meetings, Friday evening of each week. *President*, J. E. Bierhardt; *Secretary*, M. L. Trowbridge, 216 Ulster Street.

TOLEDO CAMERA CLUB—Toledo, Ohio. Member of the American Federation. Headquarters, Museum of Art. Meets second Wednesday of month. *President*, Howard Heimerdinger; *Vice-President*, Louis W. Breede; *Secretary*, Harry Webb, 1019 Prouty Avenue; *Treasurer*, M. W. Chapin.

TORONTO CAMERA CLUB—Toronto, Canada. Established 1887. Incorporated 1893. Headquarters, 2 Gould Street. Membership, 195. Date of meetings, every Monday, from October to April, inclusive. *President*, Hugh Neilson; *Secretary-Treasurer*, Edward Y. Spurr. Date of annual exhibition, March or April.

TOWN AND COUNTRY CAMERA CLUB—St. Paul, Minn. Established 1901. Date of meetings, every week, at which lectures and demonstrations are given pertaining to camera work. Outing excursions on May 30. *President*, George L. Nevins; *Secretary*, M. W. Wright, Kenyon, Minn. Exhibitions annually.

WILKES-BARRE CAMERA CLUB—Wilkes-Barre, Pa. Rooms, Poli Building. Meets every Tuesday, 8 o'clock. *President*, H. C. Shepherd; *Secretary*, E. Reisser, 847 Franklin Street. Exhibition annually, in the spring.

WINNIPEG CAMERA CLUB—Enderton Building, Portege Avenue, Winnipeg, Manitoba, Canada. Organized February 29, 1902. Membership, 30. Meetings monthly at call of Secretary. Exhibition, second week in May. *President*, A. E. Hearn; *Secretary*, J. M. Iredale.



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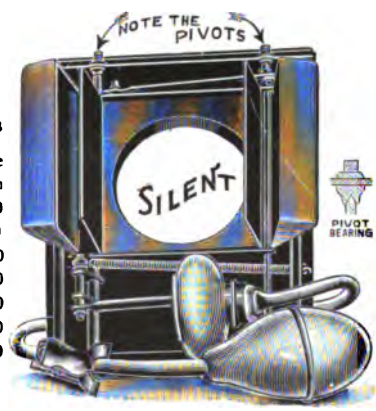
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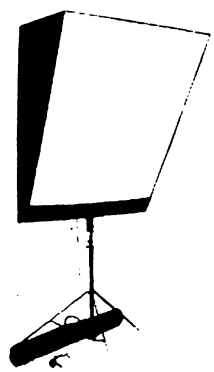
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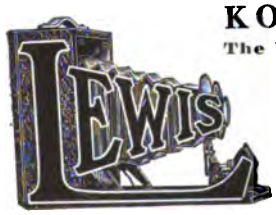


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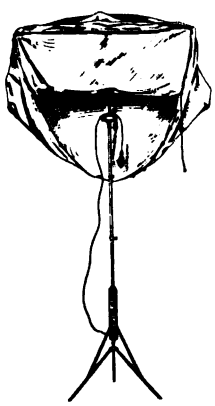
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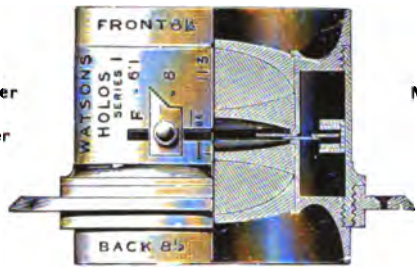
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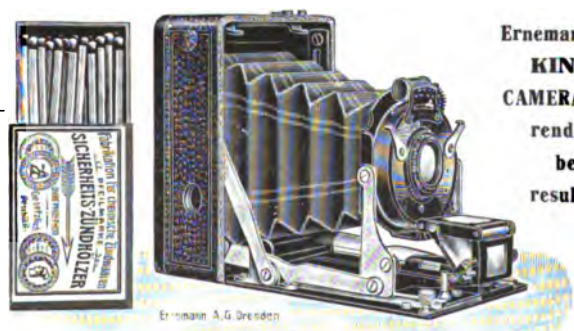
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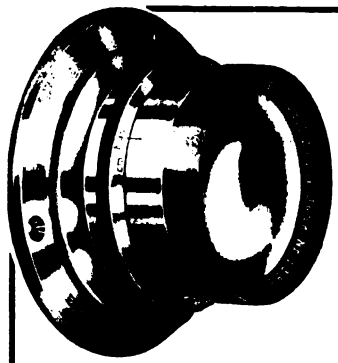
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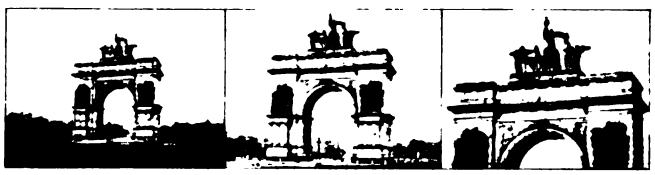
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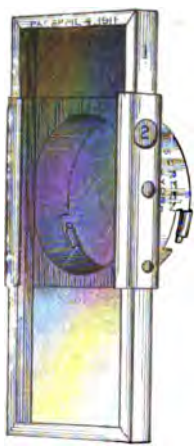
(Patented July 16, 1900)



you can instantly locate any negative desired. This file provides a perfect means **of storing and indexing negatives.** It is a heavy pasteboard box covered in imitation morocco, fitted for 50 glass negatives or a larger number of films, separated by pasteboard frames. An index is in front of each file.

3¼	x	4¼	 $0.30	6½	x	8½	 $0.65
4	x	5	35	8	x	10	75
5	x	7	45	3¼	x	4	For lantern slides.. .30

ROYAL FOREGROUND RAY SCREEN



Patented April 4th, 1911

Style B (Universal)

An oblong ray filter graded from a deep yellow on one end to practically colorless glass on the other, mounted in a sliding frame so as to bring a filter of any desired depth of color in front of the camera lens.

In the Style B Foreground we offer a ray filter for every conceivable orthochromatic purpose.

Maximum speed is attained for instantaneous exposures by means of the colorless or faintly tinted sections and maximum orthochromatism, or rendering of the true color values, by using the deeply colored portions, with every possible gradation intervening.

The frame of the filter is numbered consecutively according to the depth of color and these numbers show through a circular opening on the mount, so that any special color intensity is readily located and the exact conditions for any previous exposure may be instantly duplicated if desired.

It slips over the front of the lens the same as a lens cap, and may be instantly attached or removed.

The Style B Foreground is the last word in Orthochromatics and its immense field of usefulness must commend it to every photographer desiring to obtain the best results in his art. *Send for booklet*

STYLE B		
No.	**Dia. Inches**	
1 B	1 1/16	$3.00
3 B	1 5/16	3.00
4 B	1 1/2	3.00
5 B	1 3/4	4.00
6 B	2	4.50
7 B	2 1/4	5.00
8 B	2 1/2	6.00
9 B	2 3/4	6.50
10 B	3	7.00
11 B	3 1/4	8.00
12 B	3 1/2	9.00
13 B	4	10.50
14 B	4 1/2	12.00

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The new Dufay Color Plates have been received with great favor—*quick fine texture*, and good for six months from time coated, are points in their favor.

All shipments received have been sold, but with receipts of plates ordered, we hope to be in a position to avoid delays in filling orders.

PRICE LIST PER BOX OF FOUR

3¼x4"	$1.20	4x5"	$1.60
3¼x4¼"	1.25	5x7"	2.00

COMPENSATING SCREENS

1¼x1¼"	$1.20	3¼x3¼"	$3.00
1¼x1¾"	1.60	4¼x4¼"	4.00
2¼x2¼"	2.00		

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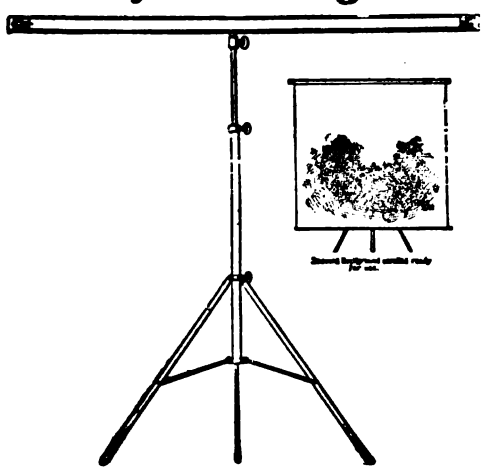
5x7"	$0.18	8x10"	$0.30

Complete set Solutions $1.25
Send for Price List and Booklet.

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Royal Background Carrier



This portable background carrier is just the thing for home portraiture. It consists of a folding standard similar to a music rack, only heavier, and a spring roller on which the ground is fastened like a window shade.

When not in use it can be taken off the stand and the stand folded up. The entire outfit can thus be easily packed in a small space.

With this stand you can preserve your ground. After you are through making your pictures, roll up the ground same as you would a window shade. It is the most practical carrier imaginable.

Carrier only - - - $2.50
Background and Carrier 3.50

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"HOW IT IS DONE"

An Explanatory Diagram Showing the Various Stages in the Production of

AUTOTYPE CARBON PHOTOGRAPHS

The Production of an Autotype Carbon Photograph

A

The Coated Surface of Exposed Carbon Tissue (Pigmented Gelatine).

B

Single Transfer Paper.

C

Soak A and B in cold water, bring coated surfaces together in contact and squeegee.

D

Place the adherent tissue and transfer paper between blotting boards for a few minutes. Next immerse in warm water, until the colored gelatine begins to ooze out at the edges.

E

Strip off the Tissue backing paper and throw it away.

F

A dark mass of colored gelatine is left on the transfer paper. This remains in the warm water and the gelatine surface is splashed over until the picture gradually makes its appearance.

G and H

Continue until completed.

I

The picture is now placed in an alum bath (five per cent) to harden the film and discharge the bichromate sensitizing salt. A rinse in cold water completes the operation.



Important to Amateur Photographers

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In order to combat the erroneous notion, somewhat prevalent amongst Amateur Photographers, that a trial of the Carbon Process necessarily entails the expenditure of a considerable sum on costly apparatus, the Autotype Company have decided to introduce cheap trial sets of the absolutely essential materials, particulars of which are appended.

In these cheaply-priced outfits it is, of course, impossible to include developing, washing or fixing tanks. For purely experimental purposes, however, some of the ordinary household crockery will serve as a makeshift, and the bathroom will be found a not altogether unsuitable apartment for carrying on operations.

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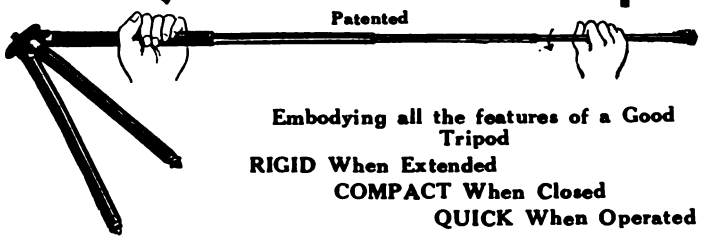
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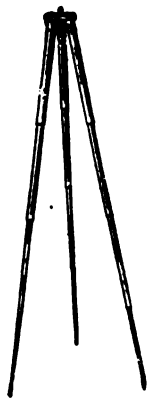
QUICK When Operated

The **Quick-Set** is **Rigid** because made of brass tubing, nickel plated. When extended it is a continuous rod of metal and will bear any reasonable weight.

The **Quick-Set** is **Compact** because when closed it is shorter than any other make; when extended longer.

The **Quick-Set** is **Quick** because it can be extended in a moment by pulling out each leg fully and giving a short twist to the left, securely locking all sections at once.

The **Quick-Set** eliminates all the defects found in other makes of tripods. It has no buttons or pins, and the legs cannot become loosened.



No. 75.

The **Quick-Set Tripod,** where fastened to the head, is reinforced by a pinion, making it absolutely unbreakable. However, in case of accident any section of the legs can readily be replaced at slight expense. Again, the **Quick-Set** does away with the objectionable buttons and springs used on other makes of metal tripods. It has no projecting parts, and the lock is so constructed that it is impossible to slip or unlock under pressure. Another feature of superiority over other metal tripods is the adjustable one; can be locked at any section, thereby shortening it, if needed.



No. 60.

Nos. 51 to 56, inclusive, are made with the legs fastened to a circular head 1¾ inches in diameter. **No. 60** lies perfectly flat, the head being a flat piece of metal ¾-inch wide, 2½ inches long, it is so made as to fold over, when extended, and form a broad triangular-shaped head.

The **No. 75** is constructed with a loose tripod screw, with a long shank, making it very easy to turn the camera in any desired direction, and then clamp firmly. The top is covered with green felt, to prevent marring the camera.

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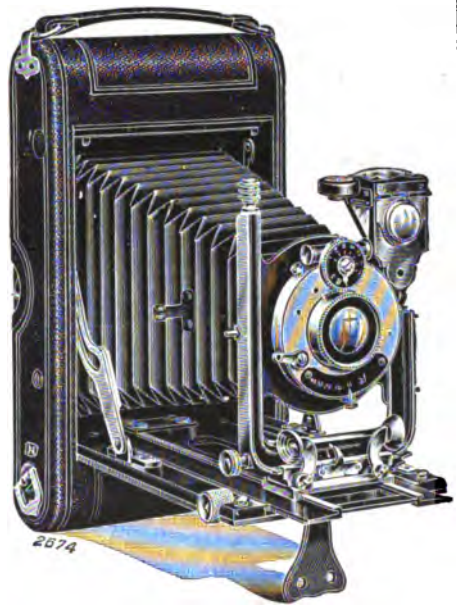
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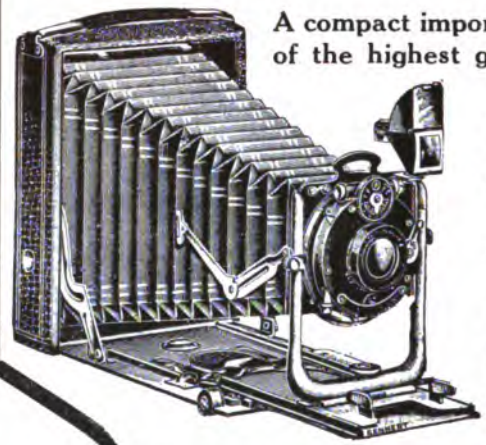
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A compact imported hand camera of the highest grade, which combines maximum efficiency with the minimum in weight and size—at a moderate price.

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Size	Although fitted with a high grade anastigmat [SYLVAR, F6.8] the Sylvar folds to only 1½ inches thickness and is 1 inch bigger than the size of the picture it makes—4¼ x 6¾ in. for the 3¼ x 5½ in. plate. The weight of the Sylvar does not exceed 32 ounces.
Plates or Films	Takes plates or cut films—filmpack Adapter supplied with camera.
Lens and Shutter	The lens and shutter equipment consists of a SYLVAR ANASTIGMAT, No. 3 focus 6-in. working at F6.8, and a Compound Shutter with speeds from 1-250th second to Time, Bulb and Instantaneous—Accurate. The Shutter is fitted with the new Antinous Release. The 12-inch bellows permits of sufficient extension for telephotography and long focus work.
Focusing	Focusing can be done on the ground glass or by focusing scale. Automatic lock for distant views. Rack and pinion for fine focusing when desired.
Rigid Front	The front is supported by U-shaped metal uprights giving absolute rigidity; and has rising and falling movements with rack and pinion device.
Finder and Level	A double reflecting finder is provided for looking down, at or through, together with a circular level—Finder and level are reversible.
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